THE UNIVERSITY OF ALBERTA

AN ANALYSIS OF TEACHER THOUGHT PROCESSES, BELIEFS

AND PRINCIPLES DURING INSTRUCTION

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

FALL, 1978

ABSTRACT

The major purpose of this study was to investigate teachers'
cognitive processes during instruction in order to categorize and
describe the beliefs, principles, rules and other factors (such as
ecological variables) that influence teachers' behavior during the
interactive phase of teaching. A second purpose of this study was to
investigate the content of the information teachers process during
instruction, while a third purpose of the study was to analyse the
effectiveness of the introspective methodology used in this project.

This study was based on a framework which assumed that teaching
is a complex process and that all facets of a teacher's behavior,
including mental processes, need to be investigated if one is to fully
understand teacher behavior. A third assumption underlying this study
is that research into teaching should take place in naturalistic
settings.

Nine teachers, three from each of grades one, three and six
were involved in the study. The teachers came from three different
schools.

Stimulated recall methodology was used to gather data concern-
ing teacher thoughts that were consciously processed during instruction.
Low inference observation data were also gathered to assist with the
interpretation of the introspective data.

The findings from this study indicated that the nine teachers
consciously processed during instruction a great variety of beliefs
that guided their interactive behavior. All teachers expressed beliefs
concerning their roles as teachers, the general classroom behavior of
pupils, and beliefs associated with how children learn and remember.

The data suggest that the teachers in this study were influenced by, and used three interrelated groups of principles, namely educational psychology principles, general pedagogical principles and principles associated with teacher classroom style. The psychological principles referred to by the teachers in this study reflected the practical application of their beliefs concerning how children learned.

The findings in this study suggest that classroom rules, grade level and subject area did not have a pervasive influence upon the teachers' behavior. However, two other major sets of variables appeared to influence the behavior of the teachers. Ecological variables appeared individually and collectively to influence teacher instructional tactics and lesson organization, and at times mediated the influence of teacher held beliefs concerning teaching and learning. The other major variable that influenced teacher behavior was termed idiosyncratic intrusion and represented a dimension of the teacher's personality or value system.

The teachers in this study showed marked similarities concerning their styles of information processing and the content of the information they processed. The majority of the teachers' thoughts were concerned with instructional tactics, perceptions and interpretations of student classroom behaviors and information about student cognitive and affective characteristics. Relatively few thoughts were related to lesson objectives or content.

All teachers in this study indicated they were consistently aware of aspects of their own behavior in the classroom and the influences of some of this behavior upon their pupils.

The stimulated recall procedures used in this study appear

appropriate for use in classrooms and provided a rich source of

information concerning teacher behavior. Recommendations in this study

have been made concerning further investigations using introspective

methodology.

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INTRODUCTION AND STATEMENT OF THE PROBLEM

Background to the Study

During the past two decades the study of teacher and pupil
overt behaviors in natural classroom settings has contributed much to
the knowledge of what teachers and pupils do in classrooms (Dunkin &
Biddle, 1974; Nash, 1976; Rosenshine, 1971). Researchers are increas-
ingly entering classrooms to investigate various aspects of classroom
life in order to better understand teaching and learning. Nuthall
(1974) emphasized the importance of this trend in classroom research by
pointing out that, "unless we have a clear picture of the way classroom
teaching operates, experimental studies may distort the nature of the
situation and provide misleading results" (p. 2). Shulman (1977) has
also said that what teachers do and think in the classroom, is the
basic source of information we have on what teaching is about.

Along with the increasing emphasis on research carried out in
naturalistic settings has come the realization that classroom life is
characterized by many interacting, complex phenomena. Jackson (1968),
Smith and Geoffrey (1968), Dunkin and Biddle (1974), Sutton (1975), and
Delamont and Hamilton (1976) have all discussed the complexities of
classroom life and have stressed that many variables must be taken into
account when attempting to understand teacher and pupil behavior in
classrooms and when attempting to establish correlations between
process and product.

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This research into classrooms during the past two decades has primarily concentrated upon the observable behaviors of both teachers and pupils. In order to gather data, large numbers of classroom observation systems have been developed. In their anthology, "Mirrors for Behavior III," Simon and Boyer (1974) outlined 99 classroom observation systems, while Rosenshine and Furst (1973) referred to 121 observation systems. The use of these observational systems has contributed significantly to understandings of classroom life. However, this research has so far basically concentrated on observable teacher behavior. The dimension of teacher behavior that deals with how teachers think, that is plan, make decisions and judgements, and the underlying beliefs and principles that influence these processes, has been a relatively neglected research tradition. This has lead Powell (1977) to emphasize that, "The picture of teaching is more complete in any case, when it includes information from multiple sources and perspectives" (p. 27).

Need for the Study

The need to investigate teacher cognitive processes has been mentioned intermittently in the literature on teaching. There is, however, an increasing awareness that research into the mental lives of teachers can contribute to a fuller understanding of teaching. This interest has been motivated by the assumption that what teachers do is influenced by what they think. Since Gage (1963) declared that: "the programs that teachers carry around in their heads need analysis" (p. 132), there has been an increasing realization of the need to investigate teachers' mental life during the various phases of teaching.

Smith and Geoffrey (1968) have pointed out that:

Teaching must be seen as an intellectual cognitive process.
What goes on in the head of the teacher is a critical ante-
cedent of what he does. The way he poses his problems, the
kinds of goals and subgoals he is trying to reach, the
alternatives he weighs as he circumvents obstacles and
barriers, the momentary assessment of potential rewards and
costs are aspects of teaching which frequently are lost to
the behaviorally oriented empiricist who focuses on what the
teacher does, to the exclusion of how he thinks about
teaching. (p. 96)

Walberg (1977) has also pointed out that questions about

teacher thought processes "have been neglected in research on teaching

and must be taken into account for a comprehensive analysis of class-

room learning" (p. 33), while Marland (1977) has stated:

In research on teaching there is increasing recognition that
teacher cognitions are an important mediating link between
curriculum intent and classroom practice, between antecedent
and consequential events in the classrooms, or between what is,
at one moment in the classroom, and what comes next. (p. 3)

A recent impetus to research into the mental life of teachers

has been given by Shulman and Lanier (1977) who stated that:

Much more needs to be known about the mental life of teachers.
Teacher behavior is recognized as an important factor in
teaching and learner outcomes, but how teachers behave and
what they do is directed in no small measure by what they
think. It is the relationship between thought and action that
becomes the critical issue in research on teaching. (p. 44)

Purpose of the Study

During the past five years the increased emphasis in investi-

gating teachers' mental life has focused upon four main areas (Clark &

Yinger, 1977). A handful of studies so far reported have concentrated

on teacher thought processes during lesson planning, for example,

Taylor (1970) and Zahorik (1975). A small number of studies have

focused upon teacher judgement, for example, Anderson (1977) and

Shavelson, Cadwell and Izu (1977), while an equally small number of studies have concentrated upon teacher interactive decision making, for example, Marx and Peterson (1975), Morine and Vallance (1975), Clark and Peterson (1976), and Marland (1977).

A fourth area of study into teachers' mental life has investigated how teachers' implicit theories, rules, beliefs, and principles influence their behavior during the interactive phase of teaching. It appears that few studies have investigated this area. Among the reported studies are those by Bussis, Chittenden and Amarel (1976), Duffy, (1977), Barr and Duffy (1978), and Marland (1977). Because much of the judgement and decision making that teachers carry out stems from their interpretation of their experiences (Clark & Yinger, 1977; Wagschal, 1969), it is important to study how teachers conceptualize and make sense of their teaching world. What personal perspectives, implicit theories, conceptual or belief systems about teaching, what principles of learning, motivation, child growth and development, rules and other factors (such as ecological variables) guide teachers' behavior during the interactive phase of teaching?

An understanding of what beliefs, principles and theories influence teacher behavior and how they influence that behavior, is basic to an understanding of the complexities of teaching. Furthermore, and in particular, as the majority of teacher education programs in North America include core courses in educational psychology (Englander, 1976) and this core component is supported by the American Association of Colleges for Teacher Education (1971), it is significant for teacher education, and teaching, that efforts are made to ascertain what psychological principles and beliefs the classroom teacher

processes in the interactive phase of teaching.

Gage (1963) has pointed out that there is a need for the teacher to apply psychological concepts and principles in the classroom. He suggested that educational psychology can assist teachers to understand how pupils learn, as well as guide the teacher in his interactive behavior in the classroom. Gage stated:

> Teachers need to know how children learn, and how they depend on motivation, readiness and reinforcement. But . . . teachers similarly need to know how to teach--how to motivate pupils, assess their readiness, act on assessment, present the subject, maintain discipline, and shape a cognitive structure. Too much of educational psychology makes the teacher infer what he needs to do from what he is told about learners and learning. (p. 133)

However, despite the widespread teaching of, and support for the various components of educational psychology, few studies have directly investigated the teacher's use of psychological principles during the interactive phase of teaching. Nuthall (1970) has stated:

> As far as this writer is aware, no one has attempted to make explicit the concepts of learning which the skilled teacher uses as he manipulates the discussions that enliven the work in his classroom. How is he interpreting the responses from his pupils? What are the signs he makes use of in determining the course of his actions? It is in the answers to these questions that the explanation of cause and effect in classroom discussion must lie. (p. 28)

Winne and Marx (1977) have been critical of "traditional" research efforts into teaching that have sought to establish a network of causal paths among a variety of variables. They stressed that, "Little emphasis has been placed on how teachers gather and process data which guide teaching practice, [and] . . . . rarely have studies characterized or described teaching treatments or students in terms of what is known about human learning" (p. 668).

If teacher thinking and teacher behavior are guided by sets of

beliefs, theories and principles, then as Clark and Yinger (1977)
pointed out, "More research is required on the relationship between
teacher implicit theories and teacher perceptions, information
processing, and behavior" (p. 301).

Therefore, the major purpose of this study was to investigate,
categorize and describe teachers' use of beliefs, principles, rules
and other factors (such as ecological variables) that influence their
behavior during the interactive phase of teaching.

The second major purpose of the study, which is composed of
several sub-purposes, was designed to build upon the work of Marland
(1977) and follow up issues raised in his study. When one analyses
the field of instructional theory, writers such as Carroll (1963, 1977),
Bruner (1966), Searles (1967), Strasser (1967), Hosford (1973), and
Bloom (1976) have to varying degrees placed emphasis on what De Vault
and Kriewall (1970) describe as the four major components involved in
any classroom instruction: (a) the content, (b) the instruction, (c)
the teacher, and (d) the learner. If one is guided by the assumption
that what teachers do is influenced by what they think and know
(Searles, 1967; Shulman & Lanier, 1977; Strasser, 1967), then it is
imperative that all aspects of teacher information processing be
investigated in order to contribute to instructional theory. As
Marland (1977) has pointed out, "further research needs to be
conducted to identify some of the more common features of teachers'
interactive information processing" (p. 239). Therefore, the second
major purpose of this study was to investigate the content of the
information teachers process during the interactive phase of teaching,
and explore teacher cognitions about lesson objectives, content,

instructional strategies, information about pupils and any general phenomena about teaching that is utilized during the interactive phase of teaching.

The third major purpose of this study was to analyse the effectiveness of stimulated recall as a research tool when used in naturalistic settings. Few studies have used stimulated recall in naturalistic settings (Clark & Yinger, 1977; Marland, 1977), and its potential weaknesses and strengths need to be ascertained if research is to benefit from the "wisdom of the practitioner" operating in a naturalistic environment.

Research Problems

The purposes of this study have been formulated in the following specific problems.

1. What categories of beliefs, principles, rules and other factors influence teachers' behavior during the interactive phase of teaching?

2. When and how do these beliefs, principles, rules and other factors influence teachers' behaviors during instruction?

3. What is the content of the information teachers process during the interactive phase of teaching?

4. Does grade level, subject area or lesson mode influence the content and style of teachers' information processing?

5. What are the strengths and weaknesses of stimulated recall methodology when it is used as a research tool?

Significance of the Study

During the past 20 years, the increasing amount of educational research that has focused upon the classroom, has done so with the major purposes of understanding teaching behaviors and the complexity of the classroom scene, so that ultimately, teaching-learning processes can be improved.

The importance of this study is five-fold. First of all, the study could increase the presently meagre body of knowledge about teaching. By moving away from a "surface level" understanding of teaching and investigating teachers' cognitive processing, teachers' instructional behavior may be further understood, with the potential for improving the teaching-learning process.

Secondly, information gained from this study could be of potential value in pre-service teacher education. Student teachers, by being made aware of teachers' styles of information processing and the content of information processed during instruction, could gain a greater understanding of the complexity of the teacher's role during instruction.

Thirdly, by investigating the beliefs, rules and various types of principles that guide teachers' behavior during the interactive phase of teaching, this study could have implications for the curricula of teacher education institutions.

Fourthly, this study could demonstrate the potential of stimulated recall methodology for use with student teachers during skill training sessions and field experience sessions. The methodology appears to offer diagnostic potential for those students who are having

difficulty in the normal classroom situation. Similarly, the method
could offer potential benefits as a diagnostic device for teachers in
the field who desire to analyse and improve their classroom
performances.

Finally, the exploratory nature of this study should generate
hypotheses that lend themselves to investigation in further research.
Few studies have so far investigated teachers' information processing
during the interactive phase of teaching. The complexities of a
teacher's mental behavior during all phases of the teaching process
offer a potentially rich source of information that when fully
investigated could contribute substantially to a theory of teaching.

Definitions of Major Terms

Major terms used throughout the study are defined as follows.
Other major terms used during the study are defined in context.

Belief: is the mental acceptance or conviction in the truth or
actuality of something.

Content Analysis: is a technique used "for making inferences by
systematically and objectively identifying specified
characteristics of messages" (Holsti, 1969, p. 14).

Ecological or Contextual Variables: refer to characteristics of the
teacher's working environment.

Development: is a relatively global term employed to include both the
maturational and growth processes that transpire from birth to
maturity.

Growth: refers to the physical aspects of development, but unlike
maturation, does not refer to the appearance of non-physical

capabilities.

Interactive: refers to the phase of teaching where the teacher is

involved in instructional activity with children in the

classroom.

Learning: refers to "a relatively permanent change in behavior or

behavioral potentiality that results from experience and

cannot be attributed to temporary body states induced by

illness, fatigue, or drugs" (Hergenhahn, 1976, p. 9).

Motivation: is concerned with the question of why man behaves and the

particular conditions that instigate and direct behavior.

Presage Variables: refer to teacher formative experiences and teacher

characteristics.

Principle: is a maxim, working hypothesis, or fundamental law that a

teacher consciously holds and which exercises a directing

influence on that person's classroom behavior (Marland, 1977).

Stimulus Point: is a particular incident at which the videotape is

stopped in order to assist a respondent to recall thoughts that

occurred concurrently with the overt incident.

Stimulated Recall: is a branch of introspective methodology in which

audio and/or visual cues are presented to facilitate a

subject's recall of the covert mental activity which occurred

simultaneously with the presented cue or stimuli.

Thought: is the intellectual product or the organized views and

principles of an individual.

Outline of the Study

This chapter outlined the theoretical background supporting the

study, discussed the major purposes of the study and presented the research questions that guided the collection of data. Major terms were defined and the significance of the study was discussed.

Chapter II serves several purposes. It first of all describes support for and against the relevance of learning and developmental theory for classroom practice. Secondly, it describes studies which have investigated the principles and beliefs that guide teachers' behaviors during instruction, thirdly it outlines psychological principles that are suggested for teacher classroom use, and fourthly, it describes studies of teacher thinking that have investigated teachers' use of principles and beliefs during instruction.

In Chapter III the research design, subjects involved in the study, assumptions, limitations, results of the pilot study and data collection procedures are described.

Chapter IV presents the development and description of the data analysis procedures contained in the study, and the reliability coefficients of the various components of the content analysis system.

The presentation and initial discussion of results is contained in Chapter V, while Chapter VI contains detailed discussion of results as they relate to the research questions. Chapter VII discusses conclusions, implications and recommendations for further research.

Chapter II

REVIEW OF LITERATURE AND RELATED RESEARCH

<u>Overview</u>

This chapter, when combined with Chapters I and III establishes the conceptual framework for this study. Chapter I has discussed the need to investigate the principles, beliefs and other factors that influence a teacher's classroom behavior and has suggested that analysis of a teacher's thought processes can provide a viable means for investigating the influence of principles, beliefs and other factors upon a teacher's interactive behavior. This chapter discusses the importance attached to educational psychology in teacher education and the relevance of psychological principles for classroom practice. A rationale is presented for the need to investigate what principles drawn from educational psychology the teacher might be using during the interactive phase of teaching.

Chapter III completes and unifies the conceptual framework for this study by describing stimuluated recall methodology and discussing the need to study teacher use of principles and beliefs through introspective means.

This chapter is divided into four interrelated sections. Section one deals with the support for and against the use of educational psychology principles and concepts by the classroom teacher in the day-to-day interactions with his pupils.

The second section in this chapter presents research into

teacher understanding and use of principles and concepts drawn from educational psychology while the third section outlines psychological principles that educational psychologists and learning theorists consider appropriate for use in the classroom context.

The fourth section of this chapter presents research into teacher thinking that has focused on teacher beliefs, principles and theories that guide their behavior during the interactive phase of teaching.

The Relevance of Educational Psychology For Teacher Education

Educational psychology has for the better part of this century been included in teacher education programs (Aspy, 1970; Englander, 1976; Frey & Ellis, 1966). However, there has never been unanimous agreement about its general content, direction and relevance for the classroom teacher. In order to illustrate the views of leading educational psychologists and educators concerning the importance of educational psychology in teacher education and its relevance for the classroom teacher a selection of the literature from these writers has been made from the past 25 years.

The purpose of this review is not to enter into a debate concerning the relevance of various psychological orientations for teacher education and the classroom teacher, but instead, to place in perspective the views of leaders in the field concerning the relevance of psychological principles and concepts for the classroom teacher.

During the 1950's educational psychology received strong support for its inclusion in teacher education programs. A number of writers considered it the most vital component in a teacher's education

and that successful use of psychological principles in the classroom provided the basic foundation for teacher effectiveness. However, other writers were more cautious in extrapolating the findings of some psychology to the classroom scene, while still other writers were critical of the manner in which educational psychology was taught in colleges.

Spalding (1950) described how educational psychology should develop and supply the basic principles which underlie and support the way in which the school deals with its human material. He also referred to the fact that educational programs must rest on the dual base of psychological and sociological principles.

Lyon (1953), while supporting the relevance of educational psychology for teachers, especially principles from learning theory, nevertheless pointed out that teacher education students were exposed to too many educational psychology ideas in their training, that they were expected to master generalities before they have had the experiences to understand them and that there was the need for practical experience for psychological principles to be assimilated and generalizations adequately made.

Skinner (1954) was also a strong supporter of educational psychology for teachers and discussed how learning theory could aid the classroom teacher. He pointed out that he had found relatively infrequent use of reinforcement in the classroom and that the use of reinforcement and schedules of reinforcement must become an integral part of the classroom teacher's behavior in order to promote learning.

Symonds (1955) pointed out that educational psychology should be an integral part of teacher education but that it had not made the

impact upon classrooms that it should have had and that teachers were still placing too much reliance upon rule of thumb methods. Symonds condemned the lag that exists between discovery and practice and then illustrated this theme by discussing how findings from motivation can assist the classroom teacher.

Lynch (1957) also considered that educational psychology had much to contribute to teacher education and that there were relevant applications of psychological concepts to the everyday life of the classroom teacher. He considered that the teacher must be well informed concerning child development, learning theory, mental health and individual differences and that only when psychological principles are integrated into the teacher's behavior patterns would he have a face-to-face competence which rested upon a solid base of "deliberative" competence drawn from these psychological principles. Lynch also pointed out that psychological principles must be shown to have practical application and that for the student to integrate them into his behavior repertoire he must be given extensive opportunities to integrate theory and practice.

During the 1960's the literature generally supported the inclusion of educational psychology in teacher education programs. However, more caution was being expressed concerning the relevance for the classroom teacher of some of the traditional elements of psychology. In some cases researchers were rejecting outright the relevance of educational psychology for the classroom teacher. Conant (1963), assisted by a panel of experts, carried out a two year investigation into teacher education. He and his team visited 77 institutions in 22 states in the U.S.A. and found that all the programs they examined

included at least one course in educational psychology. Conant pointed out that there must be cautious use of psychological theory based on animal studies or on human learning in situations that are much simpler than the classroom and that there might be problems in the teacher's transfer of psychological knowledge to the classroom. However, Conant pointed out in his discussion on the value of educational psychology for teachers that teaching should be based on a study of how children learn and develop.

Conant concluded his discussion on educational psychology by stating:

> After listening to many arguments, eliciting the opinions of many teachers, and reading some of the textbooks used in courses in education, I have come to the conclusion that there are perhaps a few principles of psychology--as well as a considerable amount of purely descriptive material--which are relevant. They are particularly relevant to the total task of teachers for the kindergarten and the first six grades . . . I have been convinced . . . that for those who teach children, psychology has much to say that is so valuable as to warrant the label "necessary," at least for elementary teachers. (p. 136)

Snygg (1963) in his presidential address to Division 15 of the American Psychological Association strongly supported the need for teachers to be well versed in learning theory that would assist them to predict, guide and plan their teaching activities. He was, however, highly critical of S-R Theory which he considered had nothing new to say to teachers. As well, Snygg rejected any reliance upon a mixed conglomeration of independent principles. He maintained that open-minded eclecticism ignored the fact that principles and data derived from different frames of reference are not co-existent, instead he argued, there is the need to develop an overarching theory of learning applicable to the classroom scene.

Shoben (1964) did not support Conant and Snygg and was critical of the inclusion of educational psychology courses in teacher education programs. He considered the courses to be full of trivia and not related to the classroom. Shoben summarized his criticisms of educational psychology by stating:

> Yet it seems abundantly clear that much of what parades under psychology's banner in the training of teachers is a dull display of complicated but trivial research, formal ideas that are cloudily abstract when perceived from the would-be teacher's angle of regard, and concepts that are bewilderingly remote from the gaiety and sadness of the human condition. (p. 436)

Frey and Ellis (1966) were also critical of the value of some educational psychology for the classroom teacher. They pointed out that educational psychology, appearing under a variety of labels, has long been part of most teacher education programs and a required course for teacher certification in many of the states in the U.S.A. However, the authors also stressed that legitimate questions remain concerning the relationship between undergraduate study in this area and the effectiveness of teacher performance in elementary and secondary classrooms.

Justman (1966) also considered that educational psychology should be an integral part of teacher education and that it has much to offer the classroom teacher. He took, however, the same view as Lynch (1957), and claimed that principles from educational psychology can only become internalized by integrating theory and practice. Justman also pointed out that educational psychology principles should not be regarded as a "bag of tricks" by the classroom teacher and that the teacher must understand the dynamics of behavior if he is to attempt to modify that behavior. It was also emphasized that the

classroom is a social setting and that teaching in the typical school is not a tutorial process, it is a social process. Therefore, laboratory derived psychological principles might need to be adapted when they are applied in the classroom.

Ausubel (1969) was not as critical as Shoben but nevertheless cautious in his acceptance of the relevance of educational psychology to the needs of the classroom teacher. Ausubel supported Justman when he stated:

> Despite the fact that education is an applied science, educational psychologists have manifested a marked tendency uncritically to extrapolate research findings from laboratory studies of simplified learning situations to the classroom learning environment. (p. 234)

Ausubel maintained the principles that govern the nature and conditions of school learning can only be discovered by taking into account the kinds of learning that occur in the classroom, as well as the salient characteristics of the learner. He suggested that where findings are borrowed from general psychology, then they must be tested for their applicability to the kinds of learning situations that exist in classrooms.

The support for educational psychology in teacher education and the relevance of educational psychology principles for the classroom teacher has continued to be discussed in the 1970's by educational psychologists and teacher educators.

In 1971, The American Association of Colleges for Teacher Education (AACTE) published a new set of standards for the evaluation of teacher education programs. The criteria focused on five instructional components basic to any teacher education program: (a) general studies, (b) content for the teaching speciality, (c) humanistic and behavioral,

(d) teaching and learning theory, with laboratory and clinical experience, and (e) the practicum.

When discussing teaching and learning theory with laboratory and clinical experience, the AACTE stated:

> There is a body of knowledge about teaching and learning that should be the basis for effective performance. If teaching is to be more than a craft, teachers need to understand the theoretical principles which explain what they do. For this reason, the study of teaching and learning theory is included as part of the professional studies component. (p. 5)

Flanagan (1970) in his presidential address to Division 15 of the American Psychological Association, pointed out that while educational psychology had contributed to classroom learning, "a survey of what is known and how this can be applied in the classroom suggests that much more research is needed and that the major break-throughs are in the future" (p. 1).

Humphreys (1970) illustrated an orientation that had developed during the 1970's, that is, he discussed and described several principles of classroom learning he considered would lead to more effective instruction. In doing so, he claimed that the principles were worded differently from other principles of learning and were immediately applicable to classroom problems. The principles Humphreys discussed dealt with: (a) exposure to curriculum experiences, (b) motivation, interest and incentive, (c) the importance of academic ability or intelligence, and (d) teaching methods or learning situations.

Combs (1972) supported and emphasized the importance of psychological principles for successful instruction. He was, however, critical of some orientations in educational psychology in teacher education. Combs maintained that courses in human growth and

development were designed to teach students about children instead of helping teachers to understand children. He further pointed out that in most colleges, educational psychology was still based almost exclusively on stimulus response schools of thoughts, which were no longer adequate for classroom use. Combs maintained that no teacher education institution could afford to base its functions on a single psychology and he strongly suggested that in order to humanize teacher education and the public schools, an alternative or additional subject, humanistic psychology, was needed. It was argued by Combs that this psychology should be a perceptual psychology capable of producing sensitivity, empathy and capacity for effective interaction.

Browne (1971), when analysing teacher education in England, stressed that educational psychology must be an integral part of teacher education. He was supportive of the fact that educational psychology courses had become much more sensitive to research findings that help the teacher to understand how children learn and develop. However, he pointed out that educational psychology courses were not yet sufficiently linked to the classroom to give the practitioner the assistance that he should be getting from the discipline.

Another British educationalist, Wilson (1975), when discussing educational theory and the preparation of teachers maintained that educational theory was in its infancy. However, he also pointed out that the teacher's role is complex and that while style and methods of being a teacher are inevitably a function of the teacher as a person, nevertheless, to operate intelligently and successfully as a teacher in a complex situation there is a need to understand people. He suggested that educational psychology (among other disciplines) can

assist the teacher to make sense of his role. It was suggested that the teacher should have personal knowledge of such matters as the psychological needs of children and preconditions for learning.

Not all educational psychologists and educationalists in the 1970's have endorsed the application of psychological principles in their present stage of development for use in the classroom.

McKeachie (1974) maintained that the laws of learning, such as reinforcement, were inadequate in their present form when applied to human cognitive learning. He maintained that some of the problems in trying to apply the laws of learning to educational situations have been associated with failure to take account of differences between humans and animals and failure to take account of important variables controlled in laboratory situations that interact with independent variables in the classroom.

McKeachie did not go so far as to reject traditional principles of learning entirely. He suggested that teachers cannot use the principles as they presently stand and that, for example, when one considers reinforcement, it should be considered in conjunction with motivational constructs. In other words, he suggested that reinforcement has been too simply conceptualized and generalized about. It was also suggested that the effect of knowledge of results is also clarified if one introduces motivational constructs. If the teacher hopes to use reward or knowledge of results to affect human learning, then he needs to know something about what expectancies of reward the learner brings to the situation, both in terms of the incentive value of the reward and the learner's estimate of the probability of achieving the reward.

McKeachie maintained that when the laws of learning are modified to take account of the fact that classrooms are composed of human individuals who have different backgrounds, needs, drives and abilities, then these laws can be applied to the complexities of human learning in classrooms.

Englander (1976) supported McKeachie by maintaining that educational psychology cannot assist the classroom teacher if it continues to rely on the findings of research which is conducted primarily in the laboratory, particularly if the subjects are not human. He maintained that the laws of learning, which have been with us for 75 years, have not been effectively translated into educational practice.

Englander suggested that there is a need to focus on the nature of individuals because classrooms are full of individuals. He further suggested that research should focus on the act of teaching, or at least on the teaching-learning paradigm and that educational psychology should be integrated with and not isolated from the other components of teacher education programs.

Phillips (1976) in a comprehensive analysis of the contributions of psychology to education supported the position of McKeachie and Englander when she pointed out that research results from the laboratory are not always useful or directly applicable to the classroom, and that there is a need to carry out research in the classroom scene.

Elkind (1976), a theoretician and researcher in the field of human growth and development, reported a recent experience where he became a school principal and found initial difficulties in relating

theory to practice. After a year in the classroom Elkind made several
conclusions. First of all, he emphasized that child development on
the practical plane can provide teachers with developmental perspec-
tives and with methods and techniques for assessing the child's view
of classroom realities. Secondly, Elkind discovered he knew little
about human learning and that human learning was intricate and complex.
He summarized his perceptions by stating, "if what children do in
school is complex, what teachers do is even more so. I was constantly
amazed at the multiple skills teachers acquired and employed with such
finesse" (p. 56).

Elkind found his teachers were particularly good at observing,
could tell when children "were fooling around" or were having difficulty
with a task and knew how they should be helped. He also found that his
teachers knew the children's idiosyncrasies very well, could anticipate
and abort difficulties and knew the curriculum so they could apportion
it in the "right dosage" to the pupils.

Elkind concluded his discussion by making some pertinent
comments about learning after his first year as a school principal:

> There is a lot to be learned about learning in the classroom.
> I believe that it is difficult, if not impossible, to under-
> stand the kind of learning that goes on in schools on the basis
> of simplified learning models. As in the case of curriculum
> content, school learning is not of the same order as the
> learning studied by experimental psychology. It is much more
> cumulative and multi-faceted than the learning explored in the
> laboratory. If we want to have a learning theory that is
> applicable to the school, then we may have to begin with
> naturalistic observation in classroom settings. (p. 56)

Content of Educational Psychology Courses

A number of educational psychologists have viewed the state of
the discipline from a different perspective by carrying out content

analysis of texts used in educational psychology courses.

Nunney (1964) surveyed trends and major emphases in educational psychology textbooks from 1948-63. He was attempting to ascertain what was considered the core of educational psychology that was regarded as essential for most teachers in training during the period 1956-63 and then to compare his findings with surveys in the past in order to determine trends in the period 1948-63.

In carrying out his survey, 11 basic texts were chosen and a documentary frequency was conducted tracing 61 topics which were identified through the review of the indices of the 11 texts. The importance attached to the major areas, as judged by the average percentage of space devoted to them in the 11 textbooks, was as follows: (a) learning--50%, (b) human growth and development--25%, (c) personality and adjustment--15%, (d) measurement and evaluation--6%, and (e) techniques and methods in educational psychology--4%.

Nunney found that there had been some fluctuations in the importance attached to learning theory. For example, it was rated first in importance in 1948, third in 1954 and first again in the period 1960-63. He concluded that there was a need for much basic research to determine which elements or areas are crucial in teacher education.

Yee (1970) reviewed 10 introductory books of readings in an attempt to identify the core ideas and authorities in educational psychology. In these books he found 416 articles written by 315 authors. Only 56 authors placed articles in more than one book and only 32 articles were repeated. In the preface of most books, the editors claimed they had selected representative, superior authors

and works. Yee concluded, "There are many spokesmen and little agree-
ment on what content is most relevant for the area . . . . Certainly
there are few authors that are recognized as universal spokesmen for
psychology" (p. 5).

Englander (1976) found support for Yee's conclusions in an
analysis of 10 textbooks in educational psychology. Forty seemingly
common psychological concepts such as reinforcement, developmental
tasks in education, and self-concept were identified by a general
summary of the various indices. Each of the texts was then reviewed
to identify the extent to which the respective authors focused on the
concepts in question. At that time (1970), no text was found to
contain more than 26 of the 40 concepts. One text included only seven.
The texts also varied in the extensiveness of their treatment of the
various concepts.

Englander in an attempt to find out what was happening in
courses in educational psychology sent a questionnaire to 55 members of
the Midwest Association of Teachers of Educational Psychology. The
respondents were asked to rate each of 75 concepts on a one-to-four
scale as follows:

Ignored: irrelevant or too complex.   (1)

Acquaintance: something to be recognized.   (2)

Comprehended: full knowledge of various facets. (3)

Fundamental: pervasive model for teaching.   (4)

In addition, each respondent was asked to indicate if students
were expected to operationalize the concept, that is, express it
behaviorally as a competency or a sub-part of a competency. Each of
the concepts was found in some current text, none was included in all

texts, and no text covered all concepts.

Twenty-four members representing a variety of institutions
responded. Only one mailing was sent. Big Ten state universities
with a long history of teacher education from six states were included.
The results showed the same diversity evident in the textbook studies.

The results of the survey showed that behavior modification was
not ignored by any respondent. Every other concept was regarded as
fundamental by some respondents and ignored by others.

The concepts that received the most attention were as follows,
with (M) representing the mean score for each concept on a four point
scale. In development, it was readiness (M = 3.04) and Piagetian
stages (M = 3.00). In personal pupil characteristics, it was intrinsic-
extrinsic motivation (M = 3.08), self-concept (M = 2.96) and level of
aspiration (M = 2.96). In the teaching-learning process, it was
operant conditioning (M = 3.33) and discovery learning (M = 3.33).
In classroom management, it was behavior modification (M = 3.50) and
interpersonal communication (M = 3.13). In measurement, it was
performance objectives (M = 3.13) and learning for mastery (M = 3.0).
These data do not tell us what ought to be taught, only that which
allegedly is taught. Englander pointed out that either way, there
existed a lamentable situation for teacher education.

Section Summary

Analysis of the literature reviewed in this section indicates
that during the 1950's educational psychology was strongly supported as
an integral part of teacher education and was considered necessary for
the effective functioning of the classroom teacher. There were few
criticisms directed at the irrelevance of educational psychology for

the classroom teacher, the major criticisms centred around poor college teaching and the fact that theory was not always integrated with practice.

The 1960's saw the continued support for educational psychology in teacher education courses. However, acceptance was not as uncritical or unqualified as in the 1950's. Educational psychologists and educationalists in general were becoming increasingly critical of the practice of extrapolating laboratory findings to the classroom scene and the lack of research in actual classrooms that attempted to find out how humans learned. The complexity of human learning was being increasingly stressed along with the need to consider the characteristics of the learner.

The 1970's saw the continued support for the relevance of principles from educational psychology for the classroom teacher. However, criticisms of traditional educational psychology have become more widespread with increasing doubts being expressed concerning the relevance of many accepted educational principles for the classroom scene. The critics of learning theory reiterated the themes of the 1960's and have emphasized the problems of extrapolating from the laboratory situation to the classroom. They pointed out that most research in learning has been carried out with animals, in simplified situations and on a one-to-one basis and that when extrapolating findings to the classroom one is then dealing with complex beings who are operating in a social setting. However, writers such as McKeachie pointed out that with adaptation and flexible interpretations in their use, many traditional psychological principles can have relevance for the classroom and guide teachers in their interactions with pupils.

Finally, content analyses of texts used in educational psychology courses served to emphasize some of the uncertainty that pervades the field of educational psychology in its search to become more relevant for the classroom teacher. The content analyses cited in this review indicated that there is little agreement on what content is most relevant for the classroom teacher.

Research into Teacher Use of Psychological Principles

Despite the wide acceptance of educational psychology as an integral part of teacher education programs, few studies have investigated the relevance teachers attach to principles and concepts drawn from educational psychology, and even fewer studies have focused upon teacher use of educational psychology principles in the various phases of teaching. The few studies that exist in this area are characterized by small and in most cases, unrepresentative samples, appear to only approach the periphery of the problem and present conclusions based upon too little evidence.

Frey and Ellis (1966) investigated teachers' perceptions of their undergraduate training in educational psychology and the values they attached to educational psychology as practising classroom teachers. The population in the study comprised 162 teachers (73 elementary and 99 secondary) who had a range in teaching experience from 2 to 20 years.

The results of the study indicated that both elementary and secondary teachers attached considerable importance to the value of a knowledge of educational psychology and considered that the content of educational psychology did have much to contribute toward making

teaching effective. The subjects rank ordered the following five areas as being most important for teaching: (a) emotional-social development, (b) motivation, (c) learning theory and the general nature of learning, (d) attitudes and character formation, and (e) intellectual development.

Elementary and secondary teachers were generally consistent in their ranking except that the elementary teachers rated the study of motivation and attitudes, and character formation as being less important than did the secondary group. Both groups were in agreement when ranking mental health, retention and transfer of training, and physical maturation lowest among the areas of study in the field of educational psychology.

While the teachers supported the value of educational psychology for the classroom teacher, they were, however, highly critical of their undergraduate educational psychology courses and considered that the quality of instruction was poor, that theory was not related to practice, that the sequencing of the courses did not relate to field experiences and that some of the areas of study were not applicable to teachers.

Jackson (1968) reported generalized findings of teachers' preactive and interactive classroom behavior based on his observations of three teachers for almost a year, four teachers for a period of two years and his interviewing of 50 master teachers.

Based upon his observations and interviews, Jackson argued that learning theory is of less potential value to the practising educator than is commonly assumed. He maintained that despite over half a century of research and the development of several sophisticated

theories, the teacher's classroom activities have been relatively unaffected by what the learning theorist has to say.

Jackson pointed out that the failure of learning theory to transform the teacher's work has been widely discussed in educational psychology circles and that three explanations are generally offered to account for this failure.

1. There is the view that the learning theorist's findings are not easily extrapolated to human learning because it is based largely on the study of lower forms of life such as rats and pigeons. It is argued that humans are more complex, and therefore, their behavior is governed by a different set of laws than those designed to account for the learning of other species.

2. There are differences in the complexities of learning tasks. According to this view, the learning theorist's knowledge applies chiefly to the acquisition of simple skills and the attainment of artificial objectives. Jackson suggested that many educators would insist that such knowledge has little to say about skills and under-standings that are complex and personally meaningful to the learner.

3. There are differences between the controlled environment of the laboratory and the interactive complexity of the classroom. In the laboratory, the observer typically observes phenomena under unnatural conditions while the teacher often has relatively little control over many of the variables impinging upon his work.

Jackson discussed two more variables that he considered placed constraints on the teacher making more use of learning theory in the classroom than he apparently does.

4. The teacher is generally working with a group of students and this

social character of the classroom adds a complicating dimension to the teacher's work that could account for his limited reliance on learning theory as a guide to action.

Jackson pointed out that the learning theorist typically works with one subject at a time and that even when the teacher is working with an individual pupil the teacher is deeply immersed in the social network of the classroom. Jackson maintained that at such moments (which he claimed are frequent in most classrooms) the teacher's knowledge of learning theory is an unlikely source of help. However, he did not indicate why this is so and gave no indication why a teacher cannot be making use of principles from learning theory in such a situation.

5. Jackson maintained that when one considers the total range of the teacher's activities and the amount of time he spends doing various things then one is "led to wonder whether the teacher's primary concern is learning after all" (p. 161). Jackson elaborated upon this point by stating that in the lower grades especially, the teacher's concern appears to be more activity-oriented than learning-oriented and that the teacher's energies are focused on achieving and maintaining student involvement in the chosen task, with the consequence that during interaction, learning "is at the periphery of his attention, rather than at the focus of his vision" (p. 162). In continuing his discussion on this point, the author claimed that teachers understand the overall relationship between their daily activities and the achievement of educational ends, but in their moment-by-moment decisions the details involved in the process of learning are not uppermost in

their minds.

Jackson concluded his discussion on the relevance of learning

theory for the classroom teacher by stating:

> The point is simply that teachers are only indirectly concerned
> with the details of the learning process, even though a vague
> understanding of the process may be found to underlie their
> immediate actions. As they have developed to date, most
> learning theories contain more information about the learning
> process than the average teacher wants, or needs to know.
> (p. 163)

Feldhusen (1970) described how in an effort to assess students'

views of their needs as prospective teachers and their views of ideal

instruction in educational psychology courses, a simple questionnaire

was developed and administered to a sample of 188 students at the

Universities of Wisconsin, Illinois and Purdue.

The sample consisted of 127 graduate students and 61 under-

graduates, 124 women and 64 men, 99 secondary majors or teachers, 45

elementary majors or teachers, and 44 who were in such areas as

guidance, counselling, speech therapy and remedial reading. A total

of 119 subjects had teaching experience while 69 did not.

The data were gathered during a university summer session and

the fall semester. To preserve anonymity the three universities were

simply referred to as X, Y and Z.

The results of the study indicated that the students in all

three schools saw the need for educational psychology courses to be

relevant to the needs of the classroom practitioner. This need was

stressed by 75% of the students at school X, 50% at school Y, and 45%

at school Z. When the subjects were asked to list the content areas

that should be included in educational psychology courses, the results

indicated little agreement. The topic, "learning theory, processes and

principles" as a category was given by 60% of the students at school X, 34% at Y and 48% at Z. Other high categories at one or more of the schools were: (a) "discipline," (b) "creativity and problem solving," (c) "mental hygiene," (d) "individual differences," (e) "testing," and (f) "interpersonal relations."

The results of this study should be treated with caution for several reasons. First of all, the respondents were all enrolled in an educational psychology course when they completed the questionnaire. One must query whether the subjects' responses were conditioned by their concurrent and preceding experiences in the course. Secondly, it appears that the results were somewhat confounded by the presence of undergraduate and graduate students in the sample as well as by the experience differential. It is possible that many of the graduate students had a preceding undergraduate course in educational psychology and experience in teaching, against which the value of the course could be judged.

Aspy (1972) investigated the relationship between teachers' knowledge of facts about learning theory and: (a) classroom behaviors described by Flanders' interaction analysis category system, and (b) levels of interpersonal functioning as assessed by Carkhuff's scales for empathy, congruence and positive regard.

The subjects in the study comprised 50 volunteer elementary teachers. Reading lessons were audiotaped and analysed using Flanders' interaction category system and the Carkhuff scales and the teachers completed a test on learning theory.

Data from the study indicated little statistical correlation between teachers' knowledge of learning theory (based on a chapter test

in a manual accompanying a popular educational psychology text) and
their classroom behavior according to the measures used to evaluate
each. The relationship between their factual knowledge and classroom
performance, as measured by Pearson's r, was found to range between
-0.27 and 0.22, with only one correlation (-0.27, student responds)
significant at the .05 level.

Aspy concluded that the findings supported a widespread belief
that university teaching of learning theory did not make much
difference in teachers' classroom performances.

Leeds University Institute of Education (1974) made a detailed
study over two years in order to gather the views of practising
teachers on teacher education and its relevance for their work in the
field. A random sample of approximately half of the primary and
secondary schools in the school jurisdictions served by Leeds
University Institute of Education was chosen. The Institute received
a 42% questionnaire return. Of those who replied, 87.2% of the primary
teachers and 80.9% of the secondary teachers considered that the
professional educational courses gave too much emphasis to theory which
included psychology, philosophy, sociology and the student's major area
of specialization. However, this report emphasized that both primary
and secondary teachers did consider psychology "useful" but that it
needed to be made more relevant and related practically to the
classroom.

Goodlad, Klein and others (1974) carried out a study to build
a picture of classroom life from kindergarten to third grade. One
important focus of the study was to ascertain to what degree the
classrooms were innovative.

The project team observed in 158 classrooms of 67 schools in 26 school districts. These were almost entirely in or around the major cities of 13 states and included a nation-wide geographic spread. Findings and generalizations for the study were based on 150 of the 158 classrooms.

During the study observers gathered data from three sources: (a) interviews with teachers, (b) interviews with principals, and (c) observation of classroom activities using a checklist method. This "Instrument for Study of Childhood Schooling" has two parts. Part One is used to gather School Information and Part Two is used to gather Classroom Information. One aspect of classroom life focused on was instruction. Goodlad and Klein's observers looked for and later analysed: (a) Modes of Instruction, (b) Role of Teacher(s), (c) Role of Learner(s), (d) Domains of Instruction (Cognitive, Affective, Psychomotor, Performance), (e) Level or Range of Instruction, (f) Use of Learning Theory (Teacher use of: (1) Motivation, (2) Reinforcement, (3) Knowledge of Results, (4) Degree and Type of Learner Involvement in Planning, Implementing the Program, (5) Opportunity for Transfer) (g) Evaluation of Instruction (Frequency, Means), and (h) Degree and Success of Individualization in Various Areas of the Program.

By using this checklist method, the researchers sought to identify use of those principles of learning and teaching which they assumed were taught in education courses and carried to some degree by teachers into the classroom. When the data were analysed, the researchers "were unable to pull out of the material pieces of data to suggest that principles of learning were being used extensively and effectively as teaching tools" (p. 83).

The researchers found little evidence of teacher use of extrinsic motivation and found that praise and verbal rewards (positive reinforcement) often were perfunctorily given and not clearly designed to attract a child's attention to the close relationship between his effort and some goal or model. While the researchers saw little application of learning principles in any specific sense they reported observing substantial supportive behavior on the part of teachers, "In general they were rather warm and encouraging, apparently seeking to establish rapport rather than to create barriers or gulfs between pupils and themselves" (p. 84).

Goodlad, Klein and others emphasized quite strongly their findings concerning teacher use of principles from learning theory by stating:

> We conclude, then, that the teachers we observed either by deliberate intent or a naturally positive attitude toward children, tended to support their pupils through encouragement and warmth in their overt behavior. But we must conclude, also, that most of them appeared to be unaware of the learning principles provided by psychologists, saw little use for them, or simply were unable to put them to use in teaching. (p. 84)

Section Summary

When one considers the emphasis given to educational psychology in teacher education, and when one considers that schools are concerned with the promotion of learning, then the few studies that have investigated directly or incidentally teachers' classroom use of principles drawn from educational psychology is rather disquieting. When one analyses the few studies presented in this review the situation is even more alarming. Only two of the studies indicated that the researchers entered classrooms. Jackson reported on the time he spent in

classrooms and generalized about teacher non-use of psychological principles without supporting his conclusions with descriptive or "hard data." Goodlad and Klein's observers were looking for some specific psychological principles using a checklist format. They spent only 45 minutes in each classroom, had no familiarization period in the classroom and had an extensive checklist with which to work. Neither Jackson's nor Goodlad and Klein's study gave operational definitions of the principles they were investigating, nor did there appear to be efforts to move beyond the surface level of instruction in order to investigate "deeper meanings" in the teachers' interactive behavior.

Some of the other studies reviewed suffer from methodological problems and their findings should be viewed with caution. For example, Feldhusen had a "mixed" population which could have confounded his results, while Aspy tested his subjects' knowledge of principles from learning theory by giving them a test from a textbook manual which dealt with only one chapter in the textbook.

If one is to discover if teachers use principles from educational psychology, how they use them, and when they use them, then there is the need to enter classrooms, operationalize definitions and penetrate below the surface level of teacher behavior.

Educational Psychology Principles
Applicable to the Classroom

There has been an increasing trend for writers in the field of educational psychology, and especially in the area of learning theory, to list and discuss principles drawn from educational psychology that

the classroom teacher can apply in both the preactive and interactive phases of teaching. A noticeable theme is that the principles cited are being drawn from a variety of theorists and researchers with different orientations.

Lists of educational psychology principles are drawn from seven writers in the field and are briefly discussed and then summarized in figure format.

The authors in their respective discussions concerning the use of the principles they cite generally agree upon several points. There is agreement that the principles should not be used in isolation, that they can be a guide to action and decision making, that until an overall systematic theory of application or instruction is developed to complement theories of learning, then the principles can provide a bridge between learning theory and rule of thumb approaches to methods courses found in some teacher education programs and that there is the need for continued research in the classroom in order to develop theories of instruction as well as of human learning.

Watson (1960) maintained that despite the many differences among psychologists, there are a number of important psychological principles which are widely accepted and which teachers can use with confidence. Watson listed 50 propositions, which he considered important for education and with which he considered psychologists of all "schools" would consistently agree. The 50 propositions are presented in 12 classifications: Nature--Nurture; Learning Process; Maturation Life Tasks; Individual Differences; Levels of Challenge; Teaching Method; "Discipline" and Learning; Group Relations; Subject Matter; Attitudes and Learning; Social Stratification and Evaluation.

In presenting the 50 propositions within these 12 categories Watson reminded the reader that in no science are truths established beyond the possibility of revision and that because psychology is a young science new facts are constantly accumulating in psychological research that will doubtless introduce some qualifications, modifications or contradictions to what is presently accepted as fact.

Wheeler (1967) has presented a list of 12 principles which he considered most learning investigators would agree upon. While giving credence to the importance of these principles Wheeler presented his list with certain qualifications. He pointed out that the teaching-learning process takes place within a particular kind of organizational framework and that the teacher should not rely on educational practice or the work of animal psychologists or learning theorists alone but should consider data from social psychology, anthropology and sociology.

Wheeler emphasized two other points concerning the application of learning theory to the classroom. First of all, in the school setting, learning always takes place within a socio-cultural matrix and any principles of learning which may be derived from individual psychology must generally be applied within large or small group situations. Secondly, it was maintained by Wheeler that, although a good deal is known about how learning proceeds, there has been little attempt by learning theorists to translate their findings into terms suitable for the practising teacher. However, despite these difficulties and the controversies apparent in learning theory, there are some statements about the process of learning on which agreement is likely. The 12 "principles" outlined by Wheeler are listed below.

1. Learning is an active process in which the learner must be involved.

2. Learning proceeds more effectively if, as well as being an active participant, the learner understands what he is learning.

3. Learning is considerably affected by individual goals, values and motives.

4. Frequent repetition of response to a class of situations is important in learning skills.

5. Immediate reinforcement promotes learning. Cognitive feedback is most effective when time-lapse is minimal.

6. The wider the range of experiences presented to the learner, the more likely are generalization and discrimination to occur.

7. Behavior is a function of the learner's perceptions.

8. Similar situations may elicit different reactions from different learners.

9. When transfer does occur, it is usually much less than people think. What there is may be attributed to similarities between the tasks involved. Both likenesses between situations and possibilities of transfer should be pointed out specifically.

10. Group atmosphere affects both learning product and accrued satisfaction.

11. Individual differences affect learning. Such differences are both biogenic and socio-cultural.

12. All learnings are multiple. Though focus may be on one particular (desired) outcome, other learnings take place simultaneously.

Seagoe (1970), in a text which specifically related learning theory to classroom practices, listed under the heading "Implications of Psychology of Learning for Teaching," 38 conclusions concerning learning which she considered the classroom teacher should take account

of. Seagoe pointed out that these conclusions were based upon
accepted principles of learning. The major principles that Seagoe
referred to included pupil involvement in goal setting, providing for
individual differences, recognizing the need for motivation, providing
cognitive feedback and reinforcement, taking account of the importance
of group atmosphere in learning, providing meaningfulness in learning,
making sure there is the active involvement of the learner in the
learning process, presenting opportunities for learner involvement in
problem solving, and providing ways to assist retention and general-
ization of learning.

Seagoe, throughout her text, demonstrated through practical
classroom application all the principles outlined above.

Griffith (1973) stressed that a teacher must be familiar with
principles derived from the fields of psychology, social psychology and
sociology. He pointed out that an understanding of psychological
principles that can be applied to the teaching-learning process assists
teachers to see and move beyond the superficial aspects of teaching to
the conceptualizations which give direction and rationality to their
efforts. Griffith suggested that teachers who have a firm grasp of
psychological principles are not working in a theoretical vacuum and
can devise teaching methods in conformity with the principles because
they have guidelines for invention and criteria for assessment.

Griffith discussed in detail 16 principles from learning,
developmental and motivational theory and listed 19 others from these
areas, as well as from social psychology and sociology, that influence
learning in the classroom. It was stressed that the list was not
intended to be comprehensive but was merely illustrative of a far

greater number of principles which have a bearing on teaching and learning.

The major principles that Griffith referred to included the recognition of individual differences, the active involvement of the learner in the learning, the need for repetition, the value of motivation, the need to provide for meaningful learning, the awareness of factors that influence retention and forgetting, the value of reinforcement, an understanding of self-concept maintenance and enhancement, transfer of training, readiness for learning and an understanding of whole versus part learning.

Hilgard and Bower (1975) discussed the application of learning theory principles in the classroom and emphasized that there are problems involved in bridging the gap from the laboratory to the class-room. They rejected the "medicine cabinet" view that the researcher can dispense aids to solve the problems of the teacher, "when a problem arises, the teacher can take a 'psychological principle' from the cabinet and apply it like a bandage or an ointment to solve the educational problem" (p. 607). It is suggested, instead, that in order to move soundly from basic research to practice, there is the need for a theory of application (a theory of instruction) to complement the theories of learning.

However, while Hilgard and Bower did not support the "medicine cabinet" view of application they claimed that the direct application of knowledge from the laboratory to the classroom is not to be entirely rejected because:

1. Often laboratory knowledge can assist one to understand what some
   of the important variables and influences are even before they

have been formulated into prescriptive form.

2. A skilled teacher may better comprehend why some practices work
   and others do not because of his acquaintance with basic learning
   principles.

3. Principles from learning theory can permit a better analysis of
   teaching by pointing out where to look and what to expect.

Therefore, in accordance with the three points made above,
Hilgard and Bower have listed 21 principles which they considered
would be accepted by psychologists from various theoretical
orientations. They have listed eight "principles" emphasized within
S-R theory, six "principles" emphasized within cognitive theory and
eight "principles" from motivation, personality and social psychology.
All the "principles" listed are included in the lists cited earlier in
this section. For example, the importance of the active involvement
of the learner in the task, the need for frequency of repetition, the
importance of motivation, the importance of reinforcement and cognitive
feedback, of learning with understanding, and the maintenance and
enhancement of the student's self-esteem are all listed and briefly
discussed by Hilgard and Bower.

Nicholls and Nicholls (1975) also discussed the application of
psychological principles to the classroom and pointed out that an
understanding of these principles could assist teachers to see what may
be relevant to pupil learning when they carry out their analyses of the
teaching-learning situation. The authors suggested that an under-
standing of psychological principles could assist teachers in creating
successful learning opportunities and devising assessment techniques.

Nicholls and Nicholls discussed 26 psychological propositions

which they then summarized into 13 major principles. The authors
emphasized that the list is merely suggestive and is not all inclusive.
Again principles dealing with social climate, memory, transfer,
readiness, attention, motivation, reinforcement, discovery learning and
recognition of pupils' stages of development were listed.

Bigge (1976) discussed in detail 14 principles of learning
that he claimed are commonly accepted by modern psychologists regard-
less of the school of psychology with which they identify themselves.
The author maintained that the principles presented were close to
classroom practice in the sense that they provided rather specific
directives to teachers and thus formed a bridge between the relatively
abstract nature of much of learning theory and the largely "how-to-do-
it" emphasis that could be found in many educational methods courses.
Bigge reiterated the warning of Hilgard and Bower that despite the use
of these principles, there should not be the neglect of "system
building." The author also agreed with Hilgard and Bower that there
is a need to recognize a "working principle" level of operation, which
has immediate applicability in practice.

Bigge, when presenting his principles, pointed out that they
had been selected from a wide range of literature, were not an
inclusive listing of working principles of learning but were samples
of the more useful, generalized statements that are supported by the
research and conclusions of reputable educational psychologists.

Principles discussed dealt with motivation, pupil selection of
goals, readiness for learning, the nature and role of practice, part
versus whole learning, retention, meaningfulness in learning, reinforce-
ment and repetition.

Summary of Principles Influencing Learning

The principles listed and discussed by the seven writers have been summarized in Table 1. The number of principles cited ranged from 12 to 50, therefore to illustrate any commonality between the lists only those principles cited at least twice have been included. It must also be pointed out that most of the writers considered their lists to be not all inclusive and in some cases as being merely illustrative of the types of principles that are of value to the classroom teacher.

Finally, it should be stressed that this summary does not illustrate agreements and disagreements between educational psychologists concerning principles of learning, it merely serves to indicate the types of principles that writers, especially those in the last six years, have considered relevant and important for guiding teacher behavior in the classroom.

Research on Teacher Thinking in the Area of Beliefs, Principles and Theories

There has been increased interest within the last five years concerning teacher information processing. This research has been based on the assumption that what teachers do is affected by what they think. Research into the mental processes that underlie behavior has largely relied upon teachers' self-reports of their thought processes which have been elicited using questionnaires, interviews, "thinking out loud" techniques and stimulated recall methodology.

Research into teacher thought processes has concentrated upon three main areas: teacher planning, teacher judgement and teacher

Table 1

Principles Influencing Learning

Principles	Watson 1960	Wheeler 1967	Seagoe 1970	Griffith 1973	Hilgard and Bower 1975	Nicholls and Nicholls 1975	Bigge 1976
Active Involvement of Learner	X	X	X	X	X	X	X
Frequency of Repetition	X	X	X	X	X	X	X
Reinforcement	X	X	X	X	X	X	X
Generalization and Discrimination	X	X	X	X	X	X	X
Novelty and Modelling			X		X	X	
Drive Conditions	X	X	X	X	X	X	X
Conflicts and Frustrations Arise in Learning	X				X	X	
The Organization of Knowledge			X	X	X	X	X
Learning with Understanding	X	X	X	X	X	X	X
Cognitive Feedback	X	X	X	X	X	X	X
Goal Setting by Learner	X		X	X	X	X	X
Divergent and Convergent Thinking	X		X	X	X	X	X

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Table 1 (Continued)

Principles	Watson 1960	Wheeler 1967	Seagoe 1970	Griffith 1973	Hilgard and Bower 1975	Nicholls and Nicholls 1975	Bigge 1976
Individual Differences	X	X	X	X	X	X	X
Developmental Stage and Influences	X			X	X	X	X
Learning is Culturally Relative	X	X	X		X		
Anxiety Level					X	X	
Motives Differ for Individuals	X	X	X	X	X	X	X
Self-Esteem	X			X	X	X	X
Group Atmosphere of Learning	X	X		X	X	X	
All Learnings are Multiple		X		X			

interactive decision making. Investigation into what beliefs, principles, theories and other factors influence teacher planning, judgement and decision making has been relatively neglected. Four studies reviewed in this area serve to illustrate the importance of beliefs, principles and theories as determinants of action, how little is known about them and their use, and finally the potential values to be gained by conducting research into teacher thinking.

Bussis, Chittenden and Amarel (1976) carried out indepth interviews (lasting approximately two and a half hours) with 60 teachers involved in an "open education" approach to instruction. The purpose of their study was to investigate the internalized under-standings and constructs that influenced the teachers' behaviors in the classroom. The guiding assumption underlying this project was that internal mental processes, for example, understandings, beliefs and values, are major underlying determinants of behavior and of the environments that people create for themselves and those around them.

When analysing the data Bussis and colleagues constructed several coding schemes that represented a blend of theoretical rationale and empirical information. The first area reported on in the study was teachers' understandings of curriculum. When interpreting the teachers' understanding of curriculum, the researchers grouped the teachers into four groups that were characterized by different "curriculum construct systems." Group one, which comprised 12% of the teachers had "grade-level facts and skills" as the dominant priority, with little evidence of innovation in the surface curriculum from what the teachers had previously practised. Group two which comprised 22% of the teachers had "grade-level facts and skills" as the dominant

priority, however, there was considerable evidence of change and experi-
mentation with the surface curriculum. With group three, (39% of the
teachers) "grade-level facts and skills" was an expressed priority, but
not the dominant priority. These teachers described a surface
curriculum that provided many opportunities for children to experience
rich and interesting content.

Group four comprised 25% of the teachers who showed little
evidence of preoccupation with "grade-level facts and skills." This
group, as did group three, provided opportunities for the children to
experience a potentially rich surface curriculum.

The second area Bussis, Chittenden and Amarel investigated was
teachers' understandings of children. They summarized their analyses
of perceived qualities under three headings: (a) needs and feelings,
(b) interests and choice, and (c) social interaction among children.
The analysis of perceptions of children's needs and feelings yielded
four patterns of coding that characterize differences of orientation
among teachers. The four groupings are outlined below:

1. Needs and feelings are only remotely perceived and lack reality
   (20% of the teachers).

2. Needs and feelings are perceived as real and their expression as
   desirable, but they are also seen to be in conflict with learning
   (15% of the teachers).

3. The expression of needs and feelings is seen as a necessary context
   for learning (32% of the teachers).

4. The expression of needs and feelings is seen as integral to and
   inseparable from the learning process (33% of the teachers).

The third area investigated by the researchers related to

teacher perceptions of children's interests and choices. Bussis and others pointed out that learning guided by children's interests and choice of activities and experiences is a core conception of the philosophy of open education and is, as well, a complex conception. When analysing the data in this section, the researchers again grouped their teachers according to four orientations.

Orientation A teachers (20%) talked very little about children's interests or choices except when they responded to specific questions about these topics. This group of teachers tended to equate children's interests according to sex-role stereotype.

Orientation B teachers (30%) while showing some diversity, nevertheless, did share two characteristic beliefs. First of all, they believed that worthwhile learning did occur when children pursued their own interests. However, choice was not considered in core areas and was restricted to "enrichment" work only. Secondly, this group equated student interest in an activity with positive effect. This group focused the majority of their remarks on group characteristics but were more sensitive to individual pupil's interests than Group A.

Orientation C teachers (22%) differed from Orientation B teachers in two major aspects. These teachers considered interest and choice in terms of individual patterns rather than group propensities, and considered that children's interests and choices could be related to core as well as elective subject areas. They also tended to perceive interests as being more manipulable by the teacher and more susceptible to influence by external stimuli such as peer pressure or the attractiveness of materials. This group also tended to accept student interests at face value and took the opportunity to use the interest to

further a student's skills in reading and mathematics. These teachers focused on what a child was interested in and did not ascertain why he exhibited this interest.

Orientation D teachers (28%) assumed that interest was a quality shared by all children, and that there was continuity and resilience in these interests. These teachers considered that part of their role involved identifying and stimulating interests. The teachers in Orientation D also considered children's interests as integral to learning, but at the same time, these teachers realized there were difficulties building on interests and integrating them into the ongoing experiences of the pupils.

The fourth area investigated by Bussis and others dealt with reciprocity and social interaction. The researchers defined reciprocity as what we learn from each other. The teachers were grouped into four orientations concerning their beliefs about the role of social interaction among children.

1. Interaction generally not perceived as significant for learning (18% of the teachers).

2. Interaction perceived as potentially interfering with learning (5% of the teachers).

3. Interaction perceived as children "instructing" one another or as learning socially accepted norms (37% of the teachers).

4. Interaction perceived as reciprocity, as a process of learning-- either cognitive, or personal-social or both (40% of teachers).

Bussis and others concluded their discussion of teachers' beliefs and conceptions about children by stating:

The conceptions of children that teachers hold are pedagogical in nature, fusing a view of learning and development with a view of instruction. The teacher observes and learns about children from a vantage point that is necessarily distinct from those of the parent, the paediatrician, the testmaker, or the research psychologist. Inherent in each of these points of view are constraints and responsibilities that affect how children are perceived and that shape ideas about learning and development. (p. 111)

Janesick (1977) carried out an ethnographic study in order to describe and explain a teacher's classroom perspective. In this study, a perspective referred to a combination of beliefs and behaviors which were composed of definitions of situations, actions and criteria for making judgements. This perspective, then, was a reflective and socially derived interpretation of an individual's encounters with his environment which then served as a basis for the actions the individual performs. It was suggested by the investigator that this perspective enabled the teacher to make sure of his or her classroom world, interpret it, and carry out his actions within it.

When gathering data, the researcher observed one teacher over a seven month period, took extensive field notes and recorded interviews with this teacher. The data were analysed regularly on a weekly basis in order to discover any patterns, relationships, or characteristics of behavior which suggested the need for further investigation. A final analysis was completed following the field work.

Janesick concluded that the perspective of the teacher she studied indicated a concern for creating a stable and cohesive group, and maintaining that group in order to facilitate the achievement of stated classroom goals. This group perspective led the teacher to focus on various components of group life which reflected his perspective. For example, the teacher provided leadership in the group

and modelled behaviors which reflected his major goals of cooperation and respect. The teacher also involved the pupils in many group activities.

Marland (1977) investigated teachers' cognitive functioning during the interactive phase of teaching. One aspect of the investigation focused on overarching principles which exerted a pervasive influence on a teacher's classroom behavior. Marland maintained that:

> The principles that were revealed by teachers under conditions of stimulated recall gave meaning to teaching behaviors many of which, to the uninitiated observer, would have seemed like capricious acts or things that a teacher did on an impulse or a whim. (p. 216-217)

Five general teaching principles were discussed by Marland: (a) the principles of compensation, (b) the principle of strategic leniency, (c) the principle of power sharing, (d) the principle of progressive checking, and (e) the principle of suppressing emotions.

The principle of compensation was used more frequently by the first grade teachers. The use of the principle involved the teacher compensating the shy, low ability and culturally impoverished children for any disadvantages they may be experiencing. The teacher made certain these pupils had frequent opportunities to answer questions and participate in all classroom activities.

The principle of strategic leniency is a special application or extension of the principle of compensation. When applying this principle the teacher took note of children who needed special attention, was lenient in applying classroom rules to them and tolerated minor interruptions and unacceptable movement around the classroom. In other words, the teacher tended to favour alleged disadvantaged children by "bending rules."

The principle of power sharing involved the teacher using the informal peer structure of the class in order to exert her own influence on the class. The teacher rewarded the acceptable behavior of pupils who were considered class leaders in the expectation that their influence would assist her in the process of classroom management. In this sense then, she was sharing with the informal power structure of peer influence in the classroom, her own responsibility to influence patterns of behavior in the classroom.

The principle of progressive checking was invoked by one teacher and involved her continuously in interrupting and checking on the progress of low ability children during seatwork as well as giving them encouragement. The teacher was intent upon identifying any work problems encountered and also was attempting to provide stimulus variation to children with short attention spans.

The principle of suppressing emotions involved the teachers in suppressing their feelings, especially when they were under stress. The teachers adhered to this principle on the assumption that if they were noisy, then this would have an influence upon the pupils and make classroom management more difficult. This principle was often used as a management strategy and the teachers would remain quiet and calm in an attempt to restore order.

The principle of suppressing emotions was also used to protect the self-concept of some students. Teachers at times appeared reluctant to criticize the incorrect responses of some students who were enthusiastically involved in the lesson. To avoid criticism teachers used innuendo or did not provide direct feedback.

Duffy (1977) and Barr and Duffy (1978) reported on a longitudinal

study of teacher beliefs in the content area of reading in elementary schools. When the study was initially conceptualized it was for the purpose of investigating what conceptual or belief systems teachers possessed (especially about reading) and if they existed, whether the systems influenced instructional patterns and ultimately the reading growth of pupils.

Duffy and colleagues developed a Proposition Sort Instrument consisting of 36 propositions. The exercise was administered to 350 teachers and 37 who indicated they had strongly-held beliefs about reading were given a variation of Kelly's Role Concept Repertory Test (REP Test) as a reliability check.

In a later phase of the study 11 teachers who were either selected using the Proposition Sort and the REP Test or nominated on the basis of their reputations were to be observed 35 times. Duffy wrote that in 1977 each of the 11 teachers had been observed 10 times. The observations were carried out using ethnographic field notes and pre- and post-observation interviews were used to determine the extent to which the teachers' instructional behavior reflected their conceptions of reading.

When results were analysed it was found that eight of the 11 teachers evidenced strong belief patterns on both the Proposition Sort and the REP Test, with two reflecting a structured (basal/linear skills) view, five reflecting an unstructured (natural language/interest/integrated whole) view and one reflecting a combination of both. Of the remaining three teachers, one tended to have an unstructured view, but it did not represent a strong pattern, while the other two teachers had no discernible pattern of beliefs.

As the study progressed, Barr and Duffy reported that data from the case studies of the 11 teachers led to conceptual shifts in the project. The researchers found that teachers reflected a combination of views rather than a single one, that they did not always make conscious and reflective decisions and that there was not a linear relationship existing between teacher conceptions and teacher behaviors. The conceptual shifts were therefore made in order to match the project with the reality of the classrooms.

Barr and Duffy reported some promising findings from the case studies. They reported that teacher belief systems are more complex than initially realized and are multidimensional. That is, beliefs about one aspect of instruction may not predict beliefs about another aspect. Secondly, they stated that beliefs influence teacher selection of instructional materials and the way help is given to pupils during reading, and thirdly, that there are institutional and classroom characteristics which mediate the influence of beliefs. For example, it was found that time schedules, required testing, class composition and constraints on materials influenced the complete operationalizing of teachers' beliefs in reading instruction.

Section Summary

The four studies reviewed in this section have emphasized the importance of teacher held beliefs, principles and constructs as determinants of action.

These studies have revealed some generalized principles held by teachers that relate to classroom learning and child development. They indicate clearly that teachers' belief systems are complex and that

teacher attempts to operationalize their beliefs and principles are influenced by the environment in which they work.

What is significant, however, is how little is known about teacher beliefs, principles and constructs, and how they influence a teacher's behavior in the classroom.

Chapter Summary

This chapter has focused on four main issues. It has reviewed the literature over the past 25 years that has discussed the relevance of educational psychology principles for the classroom teacher. Secondly, it has presented research findings concerned with teachers' use and understanding of educational psychology principles. Thirdly, this chapter has outlined psychological principles that educational psychologists and learning theorists consider relevant for use in the classroom. Fourthly, the final section of this chapter summarized research into teacher beliefs, principles and theories considered to influence teacher behavior during the interactive phase of teaching.

The literature reviewed has generally been supportive of the importance of educational psychology for the classroom teacher. However, during the past ten years this support has not been unqualified, and in some cases, the relevance of much of educational psychology for the classroom teacher has been disputed. Critics of educational psychology have concentrated upon two main areas. The teaching of educational psychology is an issue raised by critics who have pointed out that there is little agreement on subject matter to be taught, that students are exposed to too much subject matter, and

theory has not been adequately linked to practice. The second area of criticism deals with the relevance of aspects of educational psychology for classroom use. An increasing number of writers have been critical of the acceptance of present learning theory for use in classroom settings. They point out that principles of learning taught in educational psychology courses have generally been derived from laboratory research with non-humans, and that these principles do not account for the complexity of human learning in complex social situations. These critics indicate that there is a need to modify principles of learning to account for the complexities of human learning and at the same time, there is the need to carry out research in classrooms to investigate human learning in social settings.

Few research studies have investigated teacher understanding and use of educational psychology principles in the classroom. These studies have generally suffered from methodological and design problems and in most cases the investigators did not enter classrooms to gather their data. As a consequence, the small amount of research in this area appears to have contributed little to an understanding of teachers' use of educational psychology principles in the classroom.

Despite the lack of research into teacher use of educational psychology principles, there has been a trend during the last 10 years for learning theorists and researchers to list principles they consider relevant for classroom use. These principles deal with factors influencing the learning process and are considered by a number of writers to form a bridge between the abstractness of much laboratory research and the practicalities of the classroom.

The final section of the chapter reviewed studies that had

investigated the beliefs and principles teachers held concerning pupils, learning, development and pedagogy in general. The studies reviewed suggest that teachers' belief systems are complex and that little is known about these beliefs and principles and how they influence behavior in the classroom.

Chapter III

DESIGN AND PROCEDURES

The purpose of this chapter is to describe the research design, selection of subjects, data sources and procedures used.

The Design

Few studies have investigated teacher information processing using introspective methodology. Therefore, because little is known about teacher cognitive processes and use of beliefs and principles during the interactive phase of teaching, this research project was planned as an exploratory, descriptive study in a natural setting. This study was exploratory in that it attempted to, "discover significant variables in the field situation, to discover relations among variables, and to lay the groundwork for later, more systematic and rigorous testing of hypotheses" (Kerlinger, 1973, p. 406).

Smith and Meux (1963) earlier strongly emphasized the need for exploratory descriptive studies when they stated:

> If very little is known about a phenomenon, the way to begin an investigation of it is to observe and analyze the phenomenon itself. It must be observed, analyzed, and classified into its various elements. Until the factors which are involved in the phenomenon are understood and described, there is little likelihood that significant correlational, predictive, or causal studies can be made. (p. 8)

The nature of this study, then, conforms to the research tradition described by Rosenshine and Furst (1973) when they outlined the descriptive-correlational-experimental loop research paradigm.

Through developing a descriptive system the researcher can explore for sets of variables which can later be tested for correlation with student outcome measures, and even later still, manipulated in experimental research situations.

Furthermore, as Marland (1977) pointed out, "it may be wise to continue conducting open-ended stimulated recall interviews with teachers to see what common concerns, cognitive processes and other phenomena emerge" (p. 224). This stance is also strongly supported by Clark and Yinger (1977).

The Subjects

Nine teachers, three from each of grades one, three and six, volunteered to participate in the study. The subjects came from three schools of approximately the same size. One elementary school in a jurisdiction adjacent to a large city provided three first grade teachers, three third grade teachers and one sixth grade teacher. The other two sixth grade teachers came from two elementary schools in a large urban school jurisdiction. There were eight females and one male teacher involved in the study. The nine teachers who participated in the study were chosen because they were the first teachers at the desired grade levels who volunteered to participate. When selecting the volunteers, two criteria were observed:

1. The teachers had to have studied at least one educational psychology course in their teacher education program.

2. The teachers had to have at least two years teaching experience in order to avoid some of the role socialization problems experienced by teachers in their first year of

service (Moskowitz & Hayman, 1974, 1976).

The specific number of teachers was chosen for several reasons.

1. In accord with the exploratory nature of the study there was the need to provide enough variability in interactive behaviors in order to provide opportunities for teacher use of principles, rules, beliefs and other phenomena to emerge.

2. The choice of three teachers for each of grade levels one, three and six was considered sufficient to indicate any potential trends or patterns in teachers' interactive behaviors that might be associated with grade level, and therefore suggest hypotheses to be tested in future research.

3. The variations in behaviors from nine teachers would provide a more representative base to evaluate the stimulated recall methodology than would the involvement of smaller numbers of teachers.

Description of Classes

All classes were relatively self-contained with limited subject specialization. Two first grades, one third grade and two sixth grades were in "semi-open" areas, while the remaining classes were in completely self-contained rooms. No team teaching was practised in any of the classrooms.

The size of the classes varied. The three first grades had between 17 and 19 pupils each, while all other classes had between 18 and 29 pupils except one sixth grade, which had 35 pupils.

The classes were grouped on a variety of patterns. Two of the

first grade classes were heterogeneously grouped while the other comprised all of the younger entrants to first grade. The three grade one classes partly operated on an integrated day organizational pattern. Morning sessions comprised language arts and mathematics where the teacher worked with the whole class, small groups and individuals. Afternoon sessions involved subject areas which included social studies, art, music and physical education.

The three third grades were streamed on reading ability while the three sixth grades were heterogeneously grouped except for one sixth grade which included a group of "slower" readers.

Selection of Grades

Grades one, three and six were chosen for several reasons:

1. They were first of all chosen because the three grade levels represent distinct phases of a student's school career. Does the fact that it was the first graders' initial year at school, that the third graders were near the end of their careers in the junior school and that it was the sixth graders' last year in elementary school, influence a teacher's cognitive processing in any different way?

2. Do different stages of pupil physical and cognitive development influence teachers' information processing in any way? For example, in Piagetian terminology, one can generalize that many of the first graders were at the intuitive or perceptual level of the pre-operational stage of cognitive development, the third graders were at the stage of concrete operations, while the sixth graders were moving from concrete operations to the formal operational

stage of cognitive development.

Selection of Content Areas

The subject areas of language arts and social studies were chosen in order:

1. To enhance the possibility of variability in the interactions between teacher and pupils. Both subject areas present a wide range of "sub-areas" allowing for a variety of teacher-pupil interactions.

2. To add to and widen the data base of information concerning teachers' information processing during the various phases of instruction.

Marland (1977) studied teacher information processing in language arts and mathematics. Presently work is proceeding in the area of mathematics (Shulman & Lanier, 1977). Hopefully it will be possible to compare the results of this study with Marland's work in language arts and from the results to develop hypotheses that can be further investigated in this subject area as well as in the field of social studies.

Collection of Data

The data for this study were collected during an 11 week period which commenced April, 1977 and concluded during the second week in June.

Specific Problems

In this study the specific problems that were investigated related to the following five major areas:

1. What categories of beliefs, principles, rules and other
    factors guide teachers' behavior during the interactive
    phase of teaching?

    What overarching principles and beliefs influence
    teachers' behavior during the interactive phase of
    teaching?
    What general pedogogical principles influence
    teachers' behavior?
    What principles from learning theory, motivation theory
    and human growth and development do teachers use during
    the interactive phase of teaching?
    What classroom rules guide teachers' behavior during
    the interactive phase of teaching?
    What other factors influence teachers' behaviors
    during the interactive phase of teaching?

2. When and how do teachers make use of beliefs, principles,
    rules and other factors during the interactive phase of
    teaching?

    Are teacher beliefs influenced by ecological factors?
    Are certain general principles used during specific
    aspects of a lesson or during particular instructional
    modes?
    Are certain psychological principles used during
    specific aspects of a lesson or during particular
    instructional modes?

3. What is the content of the information teachers process
    during the interactive phase of teaching?

What general phenomena about teaching are revealed
by content analysis of teachers' interactive thoughts?
What considerations do teachers give to objectives,
content and instructional strategies during the
interactive phase of teaching?
What categories of information about pupils do
teachers carry around in their heads? How is this
information used during interaction with pupils?

4. Does grade level, subject area or lesson mode influence
the content and style of teachers' information processing?
Do teachers at different grade levels place more
emphasis on content or process?
Do teachers at the different grade levels emphasize
different psychological principles and general
pedagogical principles during the interactive phase of
their teaching?
If principles are stressed, are they related to lesson
mode or content area?

5. What are the strengths and weaknesses of stimulated recall
methodology when it is used as a research tool?
How effective is the strategy of both interviewer and
respondent stopping the videotape at stimulus points?
At what stimulus incidents and during what period of
the lesson are teachers unable to recall their inter-
active thoughts?

Assumptions

This investigation of the interactive thoughts of teachers using introspective methodology is based on five fundamental assumptions:

1. that the interactive thought processes of teachers are important determinants of teacher behavior during the interactive phase of teaching.

2. that teacher information processing would include information about the various components of the instructional process.

3. that the sample of interactive thoughts recalled would be representative of the teacher's thoughts throughout the particular lesson videotaped.

4. that the teachers can verbally articulate their interactive information processing.

5. that the period of familiarization undergone by teachers and pupils ensured observed behaviors approximating their normal classroom behaviors.

Limitation

The principal limitation of the study refers to the non-standardization of variables involved in the teacher's task environment.

The variations in the specific objectives of the lessons, the content and experiences involved, the length of the lessons, and class-room organizational patterns, militate against the generalizability of the results from the study.

Summary of Data Sources

The types of data collected to answer the research questions are outlined below.

Pre-Lesson Interviews

A pre-lesson interview was carried out prior to the videotaping of each of the stimulus lessons. Information from the pre-lesson interview is used in the study to assist in the description of teachers' covert behavior and also in the development of lesson vignettes. The pre-lesson interview contained information about lesson objectives, organization, content and materials. The pre-lesson interview schedule is listed in Appendix A.

Videotapes of Lessons

Nineteen lessons, each 30 to 60 minutes long, were videotaped. Each teacher (with one exception) taught two lessons, one in language arts and one in social studies. One sixth grade teacher taught three lessons, one social studies and two language arts lessons. The two language arts lessons were filmed as a precautionary measure because doubts were raised at the time of gathering data whether there was sufficient teacher-pupil interaction in one language arts lesson. However, both language arts lessons have proved rich sources of data and, therefore, have been included in the study.

Stimulated Recall Interviews

All interviews were conducted within 24 hours of the filming of the stimulus lessons. The interviews ranged from approximately 45 minutes to nearly two hours in duration and were all audiotaped.

Typewritten transcripts of all interviews were prepared. The actual procedures and techniques used in the stimulated recall process are described later in this chapter.

Teacher Presage Data

All teachers supplied demographic data such as training, length of teacher experience, and work involvement in the school.

Field Notes

To assist in the familiarization phase of the study, and in the interpretation of the stimulated recall data, a great variety of field notes were made. Information included class timetables, seating plans, names of children, grouping patterns and information about pupils.

The Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

This instrument is a source of classroom process behavior. It is a comprehensive low inference observation system developed by Brophy and Good (1969) and refined by Brophy and Evertson (1973). It was designed to capture the naturally occurring sequences of teacher-pupil interaction in elementary classrooms, as well as every interaction between the teacher and individual students. The instrument takes into account contextual differences and is based on real and psychologically meaningful units of classroom interaction (Brophy & Good, 1969, 1970; Brophy & Evertson, 1973). The authors report that it is possible to train coders to reach an 80% agreement criterion using a strict definition of agreement.

A large number of interaction variables can be derived from

raw data collected with this system. The variables are of two types:
(a) frequency measures which reflect quantitative aspects of teacher-
pupil interaction, and (b) percentage measures which reflect the
qualitative aspects of interaction. This instrument was used to gather
data concerning the overt behavior of teachers which could be used to
corroborate and assist in the explanation of their covert behavior.
The system is outlined in Appendix B.

Phases in the Pilot Study

Training and Pilot Study

The gathering of introspective data in naturalistic settings
demands various roles and associated skills to be used by an individual
researcher. When research is carried out by one person alone, then
there is need for the researcher to be experienced in the operation
of audiovisual equipment, the use of familiarization techniques and
interviewing procedures and techniqes.

Laboratory Training

Three weeks were spent by the researcher during which he:
1. Experimented with and gained skill with audiovisual
   equipment.
2. Developed with the assistance of Marland (1977):
   (a) Familiarization strategies, (b) Filming techniques,
   (c) Stimulated recall procedures, (d) Interviewing
   techniques, and (e) Transcribing techniques.
All techniques are described later in this chapter.

Pilot Study Fieldwork

The pilot study fieldwork took approximately four weeks and was undertaken in order to:

1. Experiment with audiovisual equipment in natural settings.

2. Develop familiarization strategies.

3. Develop interviewing procedures and techniques.

4. Ascertain if stimulated recall methodology was suitable for answering the proposed research questions.

Subjects

Two teachers, one in each of fifth and sixth grade, participated in the pilot study. Two weeks were spent with each teacher, with the first week being a familiarization week which was designed to allow the teacher and pupils to become accustomed to the researcher and the audiovisual equipment. During this week of familiarization the teacher and pupils were shown between three and five videotaped lessons of "themselves in action."

After the periods of familiarization the grade five teacher taught a language arts lesson and the grade six teacher a social studies lesson.

Results of the Pilot Study

The audio tapes of the stimulated recall interviews were immediately transcribed and submitted to a staff member at the University of Alberta and two graduate students using stimulated recall methodology. This procedure was followed to gain feedback on interviewer style and the relevance of the data for answering the research questions.

The pilot study produced the following generalized and specific results.

1. A familiarization period of one week appeared sufficient. After one week's filming the classes showed few overt signs that they were concerned by the presence of the researcher and the audio-visual equipment. Both teachers reported feeling comfortable teaching in the presence of the researcher and the audiovisual equipment.

2. It was concluded that stimulated recall interviews should not generally exceed one and a half hours in length. Both teachers expressed discomfort (tiredness) after an hour and a half.

3. During the stimulated recall interviews the videotapes were stopped at the following stimulus points: the teacher asking questions, explaining to both individuals and the whole group, describing, demonstrating, using the chalkboard, using an overhead projector, using a wall map, reading from books, listening to a variety of pupil verbal behaviors, walking down aisles supervising, writing on the chalkboard, reviewing past work, reprimanding children, etc.

   In all cases, both teachers recalled their interactive thoughts that were associated with the above stimulus points.

4. The videotape was stopped a minimum of 25 times during both interviews. Teachers responded without hesitation whether it was the interviewer or teacher himself who stopped the videotape at a stimulus point.

5. Analysis of the transcripts revealed that the two teachers' information processing styles showed they were consciously or

unconsciously using the following psychological and general

pedagogical principles:

> Cognitive linking; frequency of repetition; generalization
>
> and discrimination; stimulus variation; reinforcement;
>
> learning with understanding; integration of subject areas;
>
> pacing of the lesson and motivation; concrete representation
>
> to explain abstract concepts; the importance of developing
>
> the learner's self-esteem, and the importance of involving
>
> the learner actively in tasks.

6. The transcripts revealed that both teachers closely monitored the

    classroom behaviors of their pupils and were cognizant of a great

    variety of pupil characteristics. Some examples of teacher thought

    in this area include the following:

    > T: Because if anybody had not finished it would probably be
    >   him.

    > T: See I almost dread asking that girl a question, or to
    >   answer anything because you can't hear her at all, she
    >   won't speak up. She does have a lot of interesting things
    >   to say . . . . She gets her hand up and I think, no I
    >   can't ask her now . . . but at the same time I want to
    >   keep her enthusiasm up so that maybe eventually she will
    >   break through and start speaking louder.

    > T: I was specifically asking X there because he spends a lot
    >   of time in class playing around and he's half listening
    >   and half not and it's hard to know when he's going to
    >   participate in discussion.

7. The transcripts revealed a great variety of information, including

    the influence of contextual variables (Dunkin & Biddle, 1974) or

    ecological variables (Doyle, 1977) upon the teacher's classroom

    behavior. For example:

    > T: I could see that there wouldn't be time to really do an
    >   adequate job of analysing a short story on the caribou . .
    >   . and it was the end of the day, they were getting tired

and so I felt it was a good thing to stop the lesson.

When discussing the heterogeneous nature of the group one teacher stated, "You have to go slow, plus you have to give something for the top people when we have discussion. You have to read over your articles twice otherwise half the class would never get anything out of it."

When discussing being part of an open area a teacher explained, "Well grade sixers usually like a lot of discussion but it's very hard to have these good discussions in an open area situation when some other group is doing an activity-oriented lesson."

Summary of Pilot Study Results

The pilot study indicated that familiarization, filming and stimulated recall procedures used were appropriate for the research project. Analysis of the stimulated recall transcripts revealed a rich source of information about teachers' thought processes. The analysis and interpretation of the transcripts revealed that teachers did, whether consciously or unconsciously, use a variety of psychological and pedagogical principles to guide their interactive behavior with their pupils. The transcripts also revealed that teachers closely monitored the behavior of the pupils in their classrooms, were aware of a wide range of pupil characteristics and were strongly influenced by contextual (ecological) variables in their interactions with the students.

Data Collection in the Study Proper

Selection of Research Methodology

Stimulated recall was chosen as the major data gathering methodology for several reasons. First of all, the researcher wanted to capture the teacher's thoughts during the interactive phase of teaching. Stimulated recall was considered less intrusive than other introspective means such as "think aloud techniques."

Secondly, the research of Jackson (1968), and Goodlad, Klein and others (1974) revealed that overt observation of teacher behaviors revealed little or no use by teachers of principles drawn from educational psychology. The pilot research indicated that teachers did process principles drawn from educational psychology as well as a variety of other beliefs and general pedagogical principles. It was concluded, therefore, that stimulated recall was a suitable methodology for investigating teachers' cognitive processing with specific reference to their interactive use of beliefs, principles and rules.

Stimulated Recall Methodology--An Overview

Stimulated recall is a branch of introspective methodology in which audio and/or visual cues are presented to facilitate a subject's recall of the covert mental activity which occurred simultaneously with the presented cues or stimuli.

Bloom (1953) stated that "the basic idea underlying the method of stimulated recall is that a subject may be enabled to relive an original situation with great vividness and accuracy if he is presented with a large number of cues or stimuli which occurred during the original situation" (p. 162).

In this research project the stimulated recall procedure consisted of showing the subjects videotaped segments of their teaching and asking questions about the processes of thinking employed during the lesson. The videotapes were shown to the teachers as soon as possible after the lessons were filmed in order to facilitate the reconstruction of their intellectual processes in as much detail as possible. Bloom (1953, 1954) pointed out that the time lag between obtaining and showing the stimulus should be no longer than 48 hours, otherwise the interviewees experience some memory loss when attempting to relive the original experiences and recall what they were thinking during the stimulus lessons that were videotaped. In this research project, to minimize memory loss all stimulus videotapes were shown to teachers within a 24 hour time period.

Uses of Stimulated Recall Methodology

Stimulated recall as a research tool does not have a long history or an extensive use. However, the number of studies using stimulated recall procedures has increased significantly over the last 10 years.

Stimulated recall has been used in studies of teaching and learning (Bloom, 1953, 1954; Clark & Peterson, 1976; Elliott, 1977; Gaier, 1952; Hudgins, 1967; Krauskopf 1963; Marland, 1977; Marx & Peterson, 1975; and Morine & Vallance, 1975). A second area in which stimulated recall has been used is that of medical education (Elstein, Kagan, Shulman, Jason & Loupe, 1972; Elstein & Shulman, 1971; and Shulman, 1974). A third area of use for stimulated recall has been in the area of psychotherapy and therapeutic counsellor education

(Kagan, 1972, 1973; Kagan, Krathwohl & Miller, 1963; Kagan & Schauble, 1969). In the field of mental health, stimulated recall has been referred to as interpersonal process recall (IPR).

A variety of methodological studies have investigated the potential of stimulated recall. Krauskopf (1963) successfully used written responses in a group situation to investigate thought processes of university students. Siegel, Siegel and others (1963) and Hudgins (1967) also successfully adapted stimulated recall to group administration "in situ." Hawes (1972) used stimulated recall as a projective tool to obtain data about the function of verbal interview behavior.

To date, stimulated recall has been used with experienced physicians, school teachers, university students, junior high school students, therapeutic counsellors and patients with mental health problems. So far most work with stimulated recall has occurred in laboratory and simulated settings, however, an increasing number of studies are using stimulated recall procedures in naturalistic settings.

Those who have used stimulated recall procedures have reported positively on its value as a research, diagnostic and teaching tool, and have commented that it has proved promising and has yielded rich, interesting data. It has so far led to an increased understanding of:

1. The differences between student information processing during discussion and lecture lessons.

2. Teacher information processing during teaching, especially teacher planning and decision making.

3. The information processing of physicians in diagnostic situations.

Finally, in the field of psychotherapy, stimulated recall has proved useful for solving a variety of counsellor education and teaching-learning problems and for accelerating psychotherapy with patients.

Summary

While so far used sparingly, stimulated recall methodology has been used in a variety of research and teaching situations and has produced research results that the investigators considered to be valid and reliable. The use of stimulated recall to date suggests that this methodology has the potential for investigating the thought processes of subjects in a great variety of situations.

Data Gathering Phases

There are various phases in a project using stimulated recall methodology in natural settings. The techniques, strategies and procedures described below were developed from various sources. They have drawn upon the work of Bloom (1953, 1954), Cannell and Kahn (1968), Marland (1977), and the researcher's own experiences using stimulated recall methodology for over five months in natural classroom settings.

Familiarization Procedures

Initial Contact with Subjects

As Richardson, Dobrenwend and Klein (1965) and Cannell and Kahn (1968) point out, the initial contact made with a subject to be involved in an interview situation is of extreme importance to the success of the project. The subject's perception of the value of the

project, the demands it will make upon his time and his motivation to be involved in, and committed to the project largely depend upon initial contact with the researcher/interviewer. Therefore, in this project, certain steps were followed during the initial contact periods. First of all, the subjects were given the following information:

1. The nature of the research project and the value to be gained from it. To avoid biasing the subject's future behavior, the project was described in general terms.

2. Task demands to be made upon the teacher.

3. Time demands to be made upon the teacher.

4. Feedback to be given to the teacher.

5. Guarantees of anonymity.

In this study, as pointed out earlier, all subjects were volunteer teachers and upon initial contact the project was explained to them. The discussion centred around a document written by the researcher and adapted from the work of Marland (1977). The document, "Material to be Presented to, and Discussed with the Interviewee" is referenced in Appendix C. The nature of the stimulated recall methodology was discussed with the prospective subjects as well as the fact that each subject would be involved in the project for approximately two weeks. The researcher indicated that he was primarily interested in studying teacher thought processes in language arts and social studies lessons. The subjects were given two days to consider the project before making a final commitment. It was considered vital to the success of the project that the subjects understood all the implications of their involvement and the demands to be made upon them.

As all teachers were to be involved in the filming of approximately
seven lessons as well as in sensitive interview situations totaling
between three and four hours, it was essential that they were highly
motivated and interested in the project, otherwise there was the
danger of gathering data that were unreliable and invalid.

Classroom Familiarization Procedures

Preparatory to the actual filming of the lessons to be used as
stimuli in the stimulated recall process, the following procedures and
strategies were followed.

1. During the familiarization period the researcher deliberately
   set out to "get to know" the teachers, that is, to establish
   rapport. The establishment of rapport with each teacher was
   considered crucial to the success of the project. As Bloom (1953)
   pointed out, "The extent to which a student will report the most
   private of his thoughts is largely a function of the rapport which
   is established in the interview situation" (p. 162). The
   researcher and each teacher met together frequently and had lunch
   and coffee together. It was decided by the researcher that as far
   as possible a neutral role should be adopted. In doing this,
   discussions with the teachers were deliberately focused on a wide
   range of common topics and attempts were made to search for common
   interests. The purposes of this strategy were to show the subjects
   that the researcher was interested in them as people, and not only
   as pieces of data, and secondly, to move discussion away from an
   over-reliance upon discussions of school where the researcher might
   unwittingly show evaluative biases.

In adopting this role, the researcher was aware that neutrality is a difficult state to attain. For example, neutral statements such as "uh-huh" can signify agreement with a subject and possibly influence a subject's perceptions of the researcher.

A neutral image can be aimed for in other ways. For example, this researcher deliberately dressed casually when he entered the schools. He dressed casually so that at one extreme he would not be aligned with school board personnel or on the other hand with a "student" who did not identify with the elementary classroom and who might not be cognizant of the elementary teachers' roles and the demands made upon them.

2. The researcher was introduced to the classes as a researcher from the university who was "interested in seeing teachers and pupils at work in classrooms." The general nature of the research was explained to the pupils, and the researcher explained to the class that he would be filming lessons during the next two to three weeks. This procedure was adopted so that the researcher was not falsely represented in the perceptions of the pupils, for example, as a television cameraman for commercial television. The researcher was aware that any misunderstandings could influence the pupils into playing roles that did not conform to their normal behavior.

3. The equipment was explained to the teacher and the children. During the first week of filming the teacher and pupils were shown tapes of lessons between three and five times in order to remove "cosmetic reactions" to the videotapes. Fuller and Manning (1973) report that, "focus on physical manifestations clearly seems to be

part of the self-confrontation experience" (p. 475). However, Bedics and Webb (1971) indicate that after three playback sessions teachers generally focus on the teaching act as opposed to their physical appearance.

The teacher was also encouraged to become familiar with the audiovisual equipment. This was done to give the teacher confidence to stop the videotape during the subsequent stimulated recall sessions.

4. The class timetable was gained from the teacher in order to ascertain when language arts and social studies lessons were being taught. A procedure followed was always to film at the time the teacher had timetabled a lesson. It was considered that altering the temporal sequence of lessons could have an influence upon the behavior of teacher and pupils.

5. When selecting lessons to be used for stimulated recall several conditions had to be fulfilled:

   (a) There had to be verbal interaction between teacher and pupils.

   (b) Each lesson had to have a number of phases that involved a variety of teacher and pupil behaviors. For example, a discussion session followed by a seatwork exercise or review of past work followed by the introduction of new work. This strategy was followed to allow for variability in teacher behavior that would provide opportunities for a wide range of principles, rules, beliefs and general teaching behaviors to be exhibited.

6. Seating plans with the children's names were obtained from the

teacher. It was considered that knowing the names of the pupils would allow the interviewer to identify pupils on the videotape and add to the fluency, and therefore, the conversational nature of the interview. It was also considered that knowing the names of pupils was one indicator to the teachers of the researcher's interest in them and their classes.

7. When to start videotaping the actual lessons to be used in the stimulated recall sessions was a problem that faced the researcher. It was decided to consult with the teachers concerning their reactions and those of the pupils to the video equipment and the researcher's presence. It was decided that when the teachers felt comfortable and reported that they considered the pupils were not unduly influenced by the video equipment, then filming could commence. The researcher also monitored the overt interest of the children in the equipment and also used the children's reactions as a gauge to when filming should start. It was generally found that by the end of one week most children paid little overt attention to the video equipment.

This researcher found that the familiarization of pupils to the videotape equipment in the schools he worked in was not a lengthy task. All schools involved in the research project had VTR's and monitors and in some cases video cameras. It was found that all sixth, third, and to a lesser extent, first graders, had had exposure to video equipment and that most pupils had previously seen themselves on videotape. Obviously, one factor influencing the pupils' adjustments to the video equipment was their past experience. Therefore, the researcher treated each teacher and each class individually.

Organizing and Preparing for Interviews

The following procedures were followed with all teachers when organizing and preparing for the stimulated recall interview.

1. The language arts and social studies lessons were filmed on separate days.

2. The stimulated recall interview time was arranged at the same time as arrangements were made for the filming of the stimulus lesson. This was done so that no time gaps of more than 24 hours occurred between filming and interviewing. Kagan, Krathwohl and others (1967) point out that delayed replay can inhibit the effectiveness of stimulating insight and detailed memory.

3. Interview times were arranged so that at least one hour could be devoted to the interview and the subject did not feel rushed.

4. Before the interview took place, the researcher previewed the videotape to select stimulus points which the pilot research suggested would be potentially valuable to stop the videotape at for the teachers to reveal their conscious thoughts that had occurred during the lesson. Where it was not possible to preview the tape (that is, where filming finished at or near the end of the school day), the researcher made certain that during the interview the videotape was stopped at a variety of stimulus points throughout the lesson.

Stimulated Recall Interviews

Physical Setting

1. The stimulated recall session was held in a quiet and comfortable

place within 24 hours of the lesson being filmed (Bloom, 1953, 1954). Only the researcher and the teacher were present. It was considered important in order for the interviewee to "relive" the stimulus lesson, that conditions should allow for the utmost concentration by the subject free from any intrusions that might inhibit the recall of thoughts.

2. The equipment was arranged in a similar way to that suggested by Marland (1977) in his "Procedures for Stimulated Recall Sessions" and is illustrated in Figure 1. The interviewee sat directly in front of the T.V. monitor and the videotape recorder (VTR) was placed next to the monitor so that both interviewer and interviewee could operate the VTR controls.

Figure 1

Arrangement of Equipment for
Stimulated Recall Session
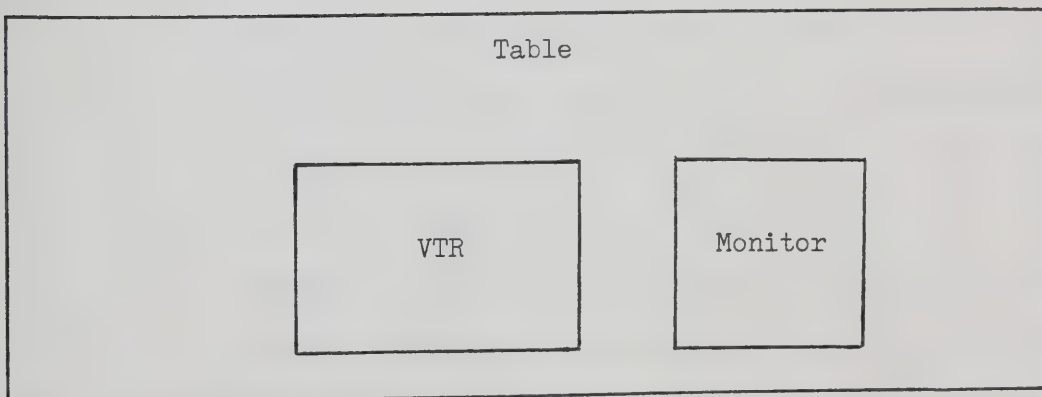
Interview Procedures

To provide for standardization of the interview situation, each interview followed exactly the procedures outlined below.

1. The interviewer began the interview session with general conversation to place the interviewee at ease.

2. The procedures for carrying out the interview were again discussed with the interviewee. (They had previously been discussed during the familiarization periods.) These procedures are described below in points 2(a) to 2 (e).

   (a) The confidentiality of the session was stressed.

   (b) The need for accurate recall was stressed and the interviewees were encouraged to indicate when they could not recall their thoughts that had occurred during the lesson.

   (c) It was stressed that the interview would focus on a sample of the teacher's thoughts spread throughout all stages of the lesson. Therefore, the interviewees were encouraged to stop the videotape at any stimulus point where they wished to share their thoughts with the interviewer. It was also pointed out that the interviewer's role was to assist the teachers to recall their thoughts and feelings during the lesson. However, it was stressed that the interviewer would also stop the tape to assist in gaining a representative sample of thoughts throughout the lesson. This procedure was a distinct methodological departure from that of Marland (1977).

   During the pilot study, the researcher's work supported Bloom's (1953) contention that, "students do not

report all their thoughts; frequently they select and report the thoughts they believe to be most relevant, or they tend to characterize their thoughts rather than report them as they occurred" (p. 162). This evidence induced the interviewer to play a more active role in selecting stimulus points than was the case in Marland's study. However, the researcher also took account of the research literature cited by Fuller and Manning (1973) which suggest that viewing a videotape representation of oneself involves intense focusing on the self and, "Since stress and anxiety may arise in video playback, the play-back may be thought of, in some circumstances, as a threatening message. Threatening messages have been shown to cause inhibiting effects . . . . It is possible therefore that self-confrontation also may have inhibiting effects" (pp. 473-474). Therefore, to assist in the creation of an atmosphere of "psychological safety" or low risk for the confrontation experience, the inter-viewee and the researcher shared the selection of stimulus points.

(d) The interviewer always stressed that the study was non-evaluative and that the videotapes were completely confidential.

(e) Before starting the interview the interviewer always checked to ascertain if the interviewee had any queries or problems.

3. It was considered that the use of the audio-visual equipment

during the interview situation contributed to the success of the
interview and the later transcribing of the audiotapes. Therefore,
the following procedures were always observed.

   (a) The counter was set at zero on the videotape and audio-
tape recorders.

   (b) The cassette tape recorder was checked to see if it was
recording satisfactorily.

   (c) The sound was switched off from the videotape recorder
before the interviewer or interviewee spoke.

Interviewing Techniques

The researcher adopted and carried out the following techniques
during the actual questioning section of the interview. These
techniques were followed in order to standardize the interview
situation and enhance the consistency of interviewer behavior across
all interviews.

1. The interviewer adopted a role that was encouraging, receptive and
interested. The facilitating role played by the interviewer was
based on Fuller and Manning's (1973) summary of the literature on
interpersonal skills which suggest:

> Helping persons have CARE: Communicated Authenticity, Regard
> for the other person which is positive, and Empathy. Their
> communications are concrete and "immediate," that is, addressed
> to the subject's present psychological state. They have
> persuasive potency, enthusiasm, genuineness. (p. 499)

In carrying out this aspect of his role, the interviewer did
not criticize or evaluate the interviewee's responses. Neutral
comments such as "uh-huh," "right," "right, fine," "hm-mm," were
used as follow-up responses to teacher verbalizations where probing

questions were not called for. Where appropriate, that is to evidence his interest, the interviewer would occasionally comment on the general performance of a child or the class. Such comments were not made in relation to the stimulus incidents discussed in the interview. Examples of such interviewer comments are:

    I: I'd love to see it.

    I: I think it's natural that teachers have reactions to children. We're human as well as they are.

2. The interviewer attempted to obtain a fluency and flow in the interview so that a discussion atmosphere would prevail, rather than a segmented, highly structured session in which the interviewee felt manipulated or threatened. In attempting to gain continuity and fluency in the interview, the interviewer used linking statements such as:

    I: Right we'll move on and see what the dinosaurs do.

    I: Right, yes, we'll go on.

    I: What we'll do, we'll skip forward a little bit there so we can get a sample right throughout the tape.

3. When the teacher stopped the videotape at a stimulus point and initiated a verbal exchange, the interviewer followed up with an open-ended probing question if the interviewee did not give reasons for his/her response. Examples of open-ended probing questions used are:

    I: Why did that surprise you then?

    I: How did you know she didn't understand?

    I: And so what were your reactions when you heard them making that noise?

If the interviewer was uncertain of the meaning of the respondent's statement or if he was not certain what the stimulus

point on the videotape was concerned with, then clarifying
questions or confirming questions were used. Examples of
<u>clarifying questions</u> are:

    I: I didn't quite catch that, how did you avoid it?

    I: Is this group 3 or group 2?

    I: What was that about, man or religion was it?

Examples of <u>confirming questions</u> are:

    I: You hadn't introduced fossils yesterday?

    I: So groups don't remain static things in your classroom?

    I: So that was your basic reason for introducing it then was
        it?

4. When the interviewer stopped the videotape at a stimulus point
and initiated the verbal exchange, he did so with an open-ended
question. Probing, clarifying and confirming questions were used
if necessary (as outlined in point 3 above). Examples of the
<u>open-ended initiatory interviewer questions</u> are:

    I: What were you thinking about when you went to the map and
        pointed that out then?

    I: What were your reactions to X's comments then?

    I: When you were explaining to him there, what was going
        through your mind then?

It should be noted that the questions used by the interviewer
to initiate a verbal exchange or probe, were deliberately kept at
the open-ended level to give the respondent freedom of response and
to avoid any biasing tendencies on the part of the interviewer.
Clarifying and confirming questions, while types of probing
questions, were deliberately more direct in order to assist the
researcher in the eventual interpretation of the data.

5. Conscious efforts were made to avoid leading questions such as:

I: Were you thinking of integrating the subjects there?

I: Were you deliberately probing there?

I: Do you always use reinforcement in instances like that?

6. Conscious efforts were made to avoid evaluative statements such as:

I: That's tremendous.

I: That's a good point.

I: Oh good.

7. Conscious efforts were made to keep the interviewer's questions to
a single focus.   Efforts were also made by the interviewer to
keep repetition to a minimum within each question asked.   Examples
of single focus questions are:

I: And how did you feel about that?

I: Did you have any thoughts about the boy's reading?

I: What were you thinking when you were reading the answer?

Examples of multiple-focus questions (to be avoided) are:

I: What were you thinking when you were asking the children
to read the words through together and when they did read
them through?

I: Just before you switch it back on. Was there any pattern
that you had of asking particular children words then?
Were you conscious of why you chose certain children to
come out and circle certain words?

8. Conscious efforts were made to avoid too frequent digressions from
the interactive data, that is, from the stimulus points and the
teacher's associated thoughts. However, the interviewer treated
each respondent as a unique individual and permitted variations in
the interview format if they were considered conducive to the
promotion of the respondent's interest and motivation in the inter-
view. This was done because, as was pointed out earlier, a
motivated and interested subject is more likely to respond with

valid data than one who is not motivated (Cannell & Kahn, 1968).
Therefore, minor digressions were permitted, if in the interviewer's
opinion the respondent appeared nervous, or particularly wanted to
stress some point.

9. During the interview the researcher continually monitored the
    respondent's behavior for tiredness or boredom. The majority of
    interviews in this researcher's study were of one and a half hour's
    duration. Two hours would appear to be the absolute maximum time
    one should demand from a teacher after a busy day's work if one is
    to maintain high levels of recall.

10. When the interview had concluded, the interviewee was asked if
    he/she had any question to ask.

11. The interviewees were always thanked for their participation in
    the interview session.

Technical Procedures

It is obvious that when the stimulated recall researcher is
carrying out an investigation as the sole researcher, then he must be
the possessor of a variety of skills. Not only must he be skilled in
observation and familiarization procedures and skilled in interviewing,
but he must also be skilled in the use and maintenance of audiovisual
equipment. The procedures and strategies related to the use of audio-
visual equipment followed in this project are outlined in detail in
Appendix D.

Preparation of Stimulated Recall Data

All stimulated recall interviews were audiotaped and then

transcribed using a Sanyo Memo Scriber. When transcribing the tapes the following procedures were adhered to.

1. The tapes contained a sequence of verbal information which took the form of lesson dialogue from the monitor followed by inter-viewer-respondent exchanges. When typing the transcripts each distinct verbal exchange was segmented off from any others by a series of dotted lines.

2. All tapes were transcribed and checked by two people. The inter-viewer checked every transcript as it was found that his recall of the lesson could assist in the interpretation of any words or passages that were difficult to comprehend. It was found that there was a need for two persons to transcribe each tape as one person did not reach a level of accuracy sufficient to transcribe every word reliably. A random sample of 10 minutes' playing time from one of each of the nine teachers' audiotapes was judged for transcription accuracy independently by two University of Alberta graduate students. The judges found no discrepancies that would alter the meaning of the transcribed text.

3. The transcripts include space in columns to enter the "stimulus point" which stimulated the teacher's recall and the ensuing verbal exchange. The time in the lesson the critical point occurred was also recorded on the transcript.
Examples of the stimulated recall transcripts are included in Appendix E.

Overt Classroom Process Data

A coder, trained in the Expanded Brophy-Good Teacher-Pupil

Dyadic Interaction Classroom Observation System, was used to code overt teacher-pupil dyadic behavior during every lesson videotaped. In order to accustom teacher and pupils to the coder's presence, he spent between four and six hours in familiarization coding in each classroom. The coder gained copies of pupil names and seating plans in order to familiarize himself with the pupils.

Two different coders were used in the study to provide for inter-coder reliability figures. Both coders had received extensive training in the use of this coding instrument and had completed eight weeks of observation in another research project before immediately commencing coding work in this project.

During the gathering of data two reliability checks on coder stability were carried out. One check was performed near the commencement of the data collection phase in the study, and another, approximately five weeks later.

Reliability was calculated using a formula proposed by Brophy and Evertson (1973) which they claim is a more stringent method than is usually used. The formula is:

Percentage agreement = number of coding decisions made by both coders and agreed upon, divided by itself plus the number of codings made by the first coder but not by the second, plus number of codings made by the second coder but not the first.

Brophy and Evertson suggest an 80% agreement criterion is highly satisfactory, but often difficult to achieve because of flurries of activity in the classroom. The intercoder reliability agreements gained during the data collection phase of this study are reported in Table 2 and compare favourably with those reported by Brophy and

Table 2

Intercoder Reliability Measures Obtained with the
Low Inference System During Data Collection

Variable	% Reliability Agreement for Two Coders on Two Occasions	
	Occasion 1	Occasion 2
Acad. resp. opportunity		
Type of respondent	76	75
Question type	89	57
Child answer	84	73
Teacher feedback	72	62*
Student initiated question		
Type	0*	0*
Teacher feedback	0*	0*
Student initiated comment		
Type	80	60
Relevancy	82	66
Teacher feedback	75	66
Private dyadic contact		
Type (Child created contact vs		
Teacher afforded contact)	64	45
Child created contact		
Type (Work vs personal)	36*	33
Teacher feedback	38*	45
Teacher afforded contact		
Type	51*	25*
Teacher reaction	68	14*
Teacher afforded contact		
Favor, managerial	8*	0*
Teacher afforded contact		
Behavior type (Warning, criticism)	18*	50*
Error type	100*	50*

*Cell frequencies are extremely low--less than 10
causing % results to be spuriously low (or high).

Evertson.

It should be noted that many of the results presented in Table 2 are spuriously high (or low) because of the low frequency of occurrence of some variables.

Chapter IV

DATA ANALYSIS PROCEDURES

The basic data in this study consisted of interview data which were gained using stimulated recall methodology as the projective tool. The interview data were audiotaped and then transferred to type-written manuscripts. To analyse the data, content analysis was used as the analytic tool. Holsti (1969) defined content analysis as a technique used "for making inferences by systematically and objectively identifying specified characteristics of messages" (p. 14). Content analysis involves coding, which is a process where qualitative data are systematically transformed into a form that renders them susceptible to quantitative treatment and permits precise description of relevant content characteristics.

The coding of qualitative data normally involves at least two operations, that of separating the qualitative material into units, and that of establishing category-sets into which the unitized material may be classified. The type of data, and the treatment of the data, will influence coding procedures and the number of steps required to enable quantitative description to be carried out. The coding procedures involved in this study are now described.

The stimulated recall data consisted of two types of data, namely interactive and non-interactive. The interactive data describes the thoughts of the teacher that were reported as occurring during the stimulus lesson. Non-interactive thoughts are those described in the

interview situation that did not occur during the lesson. Therefore, the first step in coding in this study was to distinguish between interactive and non-interactive thoughts. In doing so, three procedures were followed:

1. Each stimulus point on the transcript was described and this along with the written text of the interview, plus the videotape of the lesson were used in order to distinguish interactive from non-interactive data.

2. Confirming and clarifying questions, described in Chapters III and V of this dissertation, were also used to assist the researcher in distinguishing between interactive and non-interactive data.

3. A set of rules or guidelines was established to guide the coder in distinguishing between interactive and non-interactive data.

An outline of the rules for distinguishing interactive data is presented later in this chapter and more fully described in Appendix F which contains details of the content analysis system.

The second step in coding was the selection of the unit of analysis. The unit of analysis is the recording unit, in other words, it is the specific segment of content that is characterized by placing it in a given category. The selection of the unit of analysis was derived from the theoretical orientation of the research questions in this project. This unit of analysis in this study is the "thought unit" or "ideational unit" as used by Bloom (1953), Taba, Levine and Elzey (1964), and Pichert and Anderson (1977). This unit can be defined as a remark or series of remarks, which expresses a more or

less complete idea, and serves a specified function. A simple word, a part of a sentence, a sentence or an entire paragraph can be designated as a thought unit. In this study, it was found that the thought unit often approximated a clause.

The selection of the amount of data to be included in each unit is referred to as unitizing (Guetzkow, 1950). Examples of data that have been classified into thought units are included in Appendix F.

The third stage of coding in the content analysis system used in this study consisted of developing a category-set. A category-set consists of a number of classes or "pigeon" holes into which the units of qualitative data may be placed. Each of these individual classes of data is known as a category. The choice of categories and selection of the unit of analysis were related decisions, for as Guetzkow (1950) pointed out:

> The development of a set of categories into which the qualitative material may be classified is always accompanied explicitly or implicitly by a decision as to the size of the unit into which the material shall be divided before it is categorized. Yet, selection of unit size seems more dependent upon the category-set employed than choice of category-set depends upon unit size. (p. 48)

Several criteria were followed when establishing the categories.

1. Categories should reflect the purposes of the research. Therefore, the selection of the categories was guided by the project's research questions and by the description of elements in the instructional process outlined in Chapter I of this dissertation. However, while there was a guiding theoretical orientation that assisted in the

selection of content categories, and while this researcher was guided by the work of Marland (1977), the coding system was ultimately derived directly from the interview data rather than by modifying an existing set of categories.

2. The categories were exhaustive, that is, all data in the transcripts could be placed in a particular category.

3. The categories were mutually exclusive. That is, no content data could be placed in more than one category.

4. The categories were derived from a single classification principle which means that conceptually different levels of analysis are kept separate.

Categories in the Content Analysis System

The 12 categories in the category-set are briefly described below. A fuller description of each category with examples is presented in Appendix F.

Instructional Moves (IM)

An instructional move is a category in which the teacher reports his thoughts about an action he was performing, had performed, or was considering performing.

Perceptions (P)

A perception is a category in which the teacher reports a sensory experience which could involve seeing, hearing, smelling, and feeling (in a physical sense).

Interpretations (I)

These are category units in which the teacher attaches meaning or an explanation to a perception. Often the perception is not referred to in the teacher's thoughts.

Expectations (E)

This category unit generally refers to the behavioral responses of pupils that the teacher expects or anticipates will happen. Expectations can also be associated with equipment, lesson content and other factors such as lesson organization.

Meditation--Pupil (MP)

This category refers to when a teacher's thoughts are reflecting on the pupil's cognitive processes. The teacher is concerned with what is "going on" in the pupil's head.

Self-Awareness (SA)

This unit indicates that the teachers are thinking about their own behavior as they interact with the pupils. Often they are evaluating their interactive behavior.

Beliefs (B)

These are statements by teachers about children and the behavior of children. These statements allude to how children learn, remember, are motivated and why they behave in certain ways in the classroom.

Objectives (O)

This is a category in which the teacher indicates pupil outcomes that are to be achieved. The reference is to what the pupil,

not the teacher, is to achieve.

Lesson Content (LC)

This unit refers to the fact that the teacher is concentrating upon subject matter. Essentially the teacher is thinking about the information that has been presented, is being presented or will be presented to the pupils.

Information--Pupil (IP)

This is a category in which the teacher recalls and/or uses information about pupils in the lesson under focus. The information can be about individual pupils or the group as a whole.

Information--Other (IO)

This category contains collections of miscellaneous thoughts that occur frequently throughout the transcripts. Often they are rules or thoughts irrelevant to the lesson.

Feelings (F)

This is a category in which the teacher reports emotions that were experienced during the lesson.

Qualities of a Content Analysis System

Holsti (1969) stated that any coding system must embody three important qualities: it must have objectivity, be systematic and possess generality.

Objectivity refers to the fact that the coding system must have explicitly formulated rules and procedures to minimize the possibilities that findings reflect the analyst's subjective predispositions

rather than the content of the communications being analysed.

Systematic means that the inclusion and exclusion of content or categories is carried out according to consistently applied rules. The content analyst should have a theoretical purpose in mind and not just look for materials to support his hypotheses.

Generality requires that the findings have theoretical relevance and can lead to comparisons with other data.

These three criteria were taken into account when developing the content analysis system and the set of coding rules and procedures which guided the data analysis. The rules deal with the distinguishing of interactive from non-interactive data, the coding of incomplete statements, and general procedures to be followed when coding. The coding rules and procedures are briefly outlined here and more fully explicated in Appendix F.

Interactive Versus Non-Interactive Data

The coder is to label all data as non-interactive if any of the following conditions apply:

1. Data in which the teachers are describing or recalling what they _were saying or doing_, or _what they had done_, instead of what they were thinking.

2. Data in which the teachers are showing _awareness_ of what they _were doing_ rather than what they were thinking.

3. Those sections of the transcripts where the teachers repeat the interviewer's dialogue or ask a question of the interviewer.

4. Those sections of the transcripts in which the teachers are engaged in general discussion about the background

characteristics of the pupils.

5. Those portions of the protocols where the teachers indicate any uncertainty about thoughts and feelings being interactive.

6. Those sections of the transcripts where the teachers, stimulated by the videotape, are discussing general features of their classes or the lessons.

7. When there is any doubt concerning any segment in the transcripts, then the data are to be coded as non-interactive.

General Rules and Procedures

1. Code each transcript segment by segment. A segment refers to the set of exchanges between interviewer and interviewee that centre around one particular stimulus point.

2. Decide, according to the guidelines whether data is interactive or non-interactive.

3. Unitize interactive thoughts by including them in brackets.

4. Do not unitize any communication that is incomplete, for example, a "false state" or a "maze." (Examples of these terms are contained in Appendix F.)

5. Using the definitions provided, allocate each interactive thought to a category.

6. When quantifying the thought units, proceed through the transcripts segment by segment. If a thought unit is repeated on several occasions in any particular segment it is only to be recorded once.

Sub-Categorization

Where feasible, that is, where numbers and the type of content permitted, the categories were sub-categorized into a set of more specific categories. A sub-category refers to a specific class of data derived from within a larger category. Each sub-category was exhaustive of the units classified within its parent supraordinate category.

The sub-categorization was carried out in order to discover the substantive components of the major categories, to investigate the beliefs, principles, and other phenomena processed by teachers and to make comparisons between teachers, lessons and grades where this was required by the research questions. For example, when instructional moves were sub-categorized (see Chapter V), it was found that teachers used specific and general pedagogical principles as well as principles drawn from the field of educational psychology. When the category of objectives was sub-categorized it was found that there were three types of objectives consciously processed by teachers: general, lesson specific and lesson facilitating (again refer to Chapter V).

This finer analysis was therefore used to reveal the substantive components of a teacher's thoughts as they were described in a particular category.

Macro-Analysis

A macro-analysis of the stimulated recall data was carried out in order to investigate if the data revealed any factors, such as contextual or ecological influences, teacher style variables and overarching principles and general pedagogical principles that

influenced a teacher's behavior during the interactive phase of teaching.

This macro-analysis was undertaken because, while the thought unit was valuable for describing certain aspects of a teacher's information processing, the fact that there could be at least two thought units in a sentence could at times fragment units of communication that were contained in a larger unit than the thought unit.

This macro coding makes no attempt to classify all of the units into a single schema and is far from being exhaustive in its treatment of all the data. The macro-analysis was carried out by reading the transcripts segment by segment and recording the frequency occurrence of a specified item of communication, for example, the influence of class size upon a teacher's behavior. The Survey Research Center of the University of Michigan and Guetzkow (1950) designated this type of coding as a "sieve" code, because it acts as a straining device by which the entire bulk of the qualitative data is combed for certain infrequently appearing items. Guetzkow maintained:

> There is no fundamental difference between a sieve code and an exhaustive code. In using a sieve code the analyst is merely not making formal acknowledgement of a large residual category "no mention." (p. 48)

Reliability of Coding

Reliability in content analysis normally depends upon the accuracy with which both the unitizing and subsequent classifying or categorizing is carried out. The content analysis in this study involved a third dimension. Before unitizing can commence, the coder has to distinguish between interactive and non-interactive data.

Interactive data in this study refer to the teachers' thoughts that were reported as occurring during the stimulus lesson filmed while non-interactive data refer to teacher behavior that occurred prior to or subsequent to the filmed lesson.

It is obvious in coding that errors in distinguishing between interactive and non-interactive data, in unitizing and in classifying, can have compounding effects that will affect the final reliability figure of the content analysis system. Guetzkow (1950) and Hawes (1972) suggested that all steps in coding should be subjected to reliability checks in order to ascertain the viability of these various procedures. This procedure of establishing reliability coefficients for each of the coding steps in the system has been followed in this study.

Holsti (1969) pointed out that a widely used coefficient of reliability is the ratio of coding agreements to the total number of coding decisions:

$$C.R. = \frac{2M}{N_1 + N_2}$$

In this formula M is the number of coding decisions on which the two judges are in agreement, and N_1 and N_2 refer to the number of coding decisions made by judges 1 and 2 respectively. This formula is used to establish reliability coefficients for the coding of data into interactive and non-interactive categories.

Unitizing reliability reflects the consistency with which coders selected the same amount of verbal behavior to be classified in each category. Comparison of the number of units obtained by the two coders, therefore constitutes a basis for evaluating the

reliability of the unitizing.

Guetzkow (1950) contended that unitizing reliability can be ascertained by expressing the difference between two coders as a percentage of the sum of the numbers of units obtained by each coder:

$$U = \frac{O_1 - O_2}{O_1 + O_2}$$

where O_1 is the number of units obtained by the first coder and O_2 is the number obtained by the second coder.

To calculate reliability of categorization and as an index of reliability when applied to the total system, Scott's formula has been used. Holsti pointed out that this index of reliability (pi) corrects not only for the number of categories in the category-set, but also for the probable frequency with which each is used. In the practical coding situation it varies from 0.00 to 1.00 regardless of the number of categories in the dimension. The Scott formula is expressed as follows:

$$Reliability = \frac{P_o - P_e}{1 - P_e}$$

where P_o (observed percent agreement) represents the percentage of judgements on which the two analysts agree when coding the same data independently; and P_e is the percentage agreement to be expected on the basis of chance. (pi) is the ratio of the actual difference between obtained and chance agreement to the maximum difference between obtained and chance agreement.

Intracoder Reliability

The investigator in this project coded all the transcript data. To gain an index of the stability of coding, intracoder reliability

was calculated for each stage of the coding process using the three
formulae outlined earlier in this chapter. Intracoder reliability was
calculated on three separate occasions, using on each occasion 15
segments of exchanges randomly selected from the transcripts of three
teachers, one from each grade level.

Intercoder Reliability

To check on the reliability of the content analysis system,
two doctoral students in Elementary Education were invited to act as
independent coders. In order to ascertain the viability of the
content analysis system and whether it was idiosyncratic to the
developer, the coders were given the Content Analysis Manual developed
by the investigator (see Appendix F) which was then discussed with
them for approximately one hour. The two judges were then given one
week to study the manual and code a randomly selected section of the
transcripts. The data to be coded comprised six pages of transcripts
consisting of 19 segments of exchanges. Three other segments were
added to ensure all categories were fully represented in the sample of
data.

Complete transcript pages were given to the judges in order
that contextual clues would assist them to distinguish interactive
and non-interactive data. A description of each stimulus point was
also included on the transcripts in order to further enhance the
contextual clarity of the data.

The judges were requested to:

1. Report on the explicitness and comprehensiveness of the
    directions and examples given in the coding manual.

2. Distinguish between interactive and non-interactive data.

3. Unitize all teacher thoughts as described in the manual.

4. Categorize all interactive sections of the data.

The two coders were asked to consult with the investigator concerning any difficulties experienced in interpreting the manual and in coding. Neither coder considered this assistance necessary during their coding. However, when the judges returned the reliability coding checks to the investigator, minor modifications were made to the coding manual such as expanding the description of several category units and increasing the range of examples illustrative of some categories.

Reliability Results

Intracoder and intercoder reliability results are reported in Tables 3 and 4 respectively. Intracoder reliability, tested for on three occasions over an approximate four month period, showed coder stability in the three phases of coding with consistently high reliability coefficients in the three coding steps.

Intercoder reliability was also consistently high and indicated, that with contextual clues, independent coders could with relatively high consistency, distinguish interactive from non-interactive data, unitize and classify the units. The unitization results (where zero indicates perfect agreement) are high and are consistent with those reported by Bloom (1953). This high agreement with the independent judges and the stability of unitizing reported by the investigator suggest that the thought unit as defined in the coding manual is a viable entity for unitization. This conclusion is also supported by Taba, Levine and Elzey (1964).

Categorization was uniformly high for both intracoder and

Table 3

Measures of Intracoder Reliability
in Content Analysis Coding

Interactive versus Non-Interactive Data

Occasion	Number of Segments Coded	Coefficient of Reliability
1	15 (from teachers 1-1, 3-1, 6-1)	.96
2	15 (from teachers 1-2, 3-2, 6-2)	.89
3	15 (from teachers 1-3, 3-3, 6-3)	.97

Unitization

Occasion	Number of Segments Coded	Coefficient of Reliability
1	15 (from teachers 1-1, 3-1, 6-1)	.013
2	15 (from teachers 1-2, 3-2, 6-2)	.009
3	15 (from teachers 1-3, 3-3, 6-3)	.032

Categorization

Occasion	Number of Segments Coded	Coefficient of Reliability
1	15 (from teachers 1-1, 3-1, 6-1)	.88
2	15 (from teachers 1-2, 3-2, 6-2)	.86
3	15 (from teachers 1-3, 3-3, 6-3)	.90

Table 4

Measures of Intercoder Reliability
in Content Analysis Coding

Interactive versus Non-Interactive Data

	Coefficient of Reliability
Investigator and coder 1	.88
Investigator and coder 2	.81

Unitization

Investigator and coder 1	.033
Investigator and coder 2	.050

Categorization

Investigator and coder 1	.85
Investigator and coder 2	.83

intercoder reliability checks. The two judges reported that none of the 12 categories caused them confusion when coding. A pleasing feature of the judges' coding was that little use was made of the residual category, "Information--Other."

As a further check on the viability of the Manual and the coding system, all disagreements between the investigator and the judges in the three phases of coding were discussed. After discussion almost unanimous consensus was reached on all previous disagreements in coding.

Holsti (1969) pointed out that the degree of reliability sought in content analysis is a contentious issue and must be related to the complexity of the task. Considering the complexity of the data and the detail involved in coding in this study, the reported intra-coder and intercoder reliability results seem to be very satisfactory.

Chapter V

FINDINGS

Overview

This chapter presents the data to answer the research questions stated in Chapter I and elaborated upon in Chapter III. It has five sections dealing with separate aspects of the data that are nevertheless related and are used in various supportive ways to answer the research questions.

Section A briefly describes the characteristics of the teachers involved in the study. These data are used throughout this chapter and Chapter VI when discussing research questions one to four.

Section B is comprised of a description of the micro-analysis of the stimulated recall data using the content analysis system developed for this research project. Each of the 12 content categories are presented, illustrated with examples from the interview transcripts and then briefly discussed. In order to present the richness and complexity of the data, a number of the major categories have been further sub-divided into sub-categories. These sub-categories have also been discussed and illustrated with examples drawn from the data.

Section C presents the macro-analysis of the stimulated recall transcripts. The macro-analysis was carried out in order to elicit from the data major trends in teacher behavior that were obscured by the micro-analysis.

Section D of this chapter presents data from the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System and briefly discusses variations in teachers' behaviors that appear to be related to grade level or subject area.

Section E presents data related to the conduct of the stimulated recall interviews and deals with interviewer and teacher verbal behavior during the stimulated recall interview situation.

SECTION A

Teacher Presage Information

All teachers in this study were volunteers and agreed to participate in the project after being informed of the project's purposes and the intrusions and demands it would make upon their classroom lives.

To preserve anonymity the teachers have been coded using two numerals. The first numeral indicates the grade level and the second numeral identifies the teacher within the grade level and also indicates the order in which the teacher was interviewed in that particular grade level. For example, teacher 3-2 indicates that this teacher works at grade three level and was the second teacher inter-viewed in this level.

Eight teachers in the study were female and one was male. Again, for the sake of anonymity the feminine gender has been used when referring to all teachers in the study.

Table 5 reveals that all teachers had a minimum of two years' experience and that they were teaching their preferred grade level. With the exception of teacher 3-2, all the other teachers had

Table 5

Teacher Presage Information

Teacher	Years of Teaching Experience	Grade Taught	Pupils in Class	Grade Level Preferred	Years Experience On Grade Level	Ed. Psych. Courses Taken
1-1	4	1st	19	1st	2	1
1-2	10	1st	18	1st	7	3
1-3	3	1st	17	1st	3	3
3-1	6	3rd	24	3-6	3	5
3-2	7	3rd	29	3-6	1	2
3-3	2	3rd	18	3-6	2	1
6-1	4	6th	35	6th	3	4
6-2	6	6th	23	6th	2	3
6-3	2	6th	27	6th	2	2

experienced at least two years' teaching on their present grade level.

The size of classes ranged from 17 to 35 with the three first grade classes being uniformly small.

All teachers had at least one educational psychology course in their teacher education program.

SECTION B

Micro-Analysis of Stimulated Recall Data

The stimulated recall transcripts were analysed using a content analysis system developed by the researcher. The data relating to the 12 categories in the content analysis system, where appropriate, have been presented in table form and then briefly discussed. The 12 categories have been presented and discussed in relation to their sub-categories which were developed in order to ascertain the categories' substantive components and explore the richness of the data. While the complexity of the data presented in the sub-categories will not be used in all cases to assist in the answering of the research problems, it is nevertheless presented in line with the guiding research philosophy of this study which is exploratory, descriptive and hypothesis generating. As little is known concerning teacher thinking during instruction, a full presentation of the data can serve as one data base for future researchers to generate research problems.

The content analysis involving the micro-analysis of teachers' interactive thoughts was carried out in order to partly answer the research questions dealing with:

1. the categories of beliefs, principles, rules and other

factors influencing teachers' behavior during instruction;

2. when and how teachers make use of these beliefs,
    principles, rules and other factors;

3. the content of the information teachers process during
    instruction;

4. the influence of grade level, subject area or lesson mode
    on teachers' information processing.

The data from the micro-analysis does not provide comprehensive
answers to all aspects of the above questions. Therefore, a macro-
analysis, described later in this chapter, has been used to provide
data to supplement the micro-analysis.

Teacher thoughts, defined as the intellectual products or the
organized views and principles of an individual, are presented in Table
6. This table presents an overview of the teachers' thoughts in their
language arts and social studies lessons and describes the represent-
ation of thoughts in each of the 12 categories of the content analysis
system.

It should be noted that Table 6 and subsequent tables in this
chapter contain the following abbreviations. L/A refers to language
arts lessons; L/AD refers to language arts drama; L/AP refers to
language arts punctuation and S/S refers to social studies lessons.
The letter N represents the total number of interactive thoughts
reported in each stimulated recall interview. These abbreviations are
included on Table 6 but not on subsequent tables.

Table 6 reveals all teachers reported thoughts that were coded
into each of the 12 categories. Teacher 6-3 did not report thoughts
in information--other in her language arts lessons but did so in her

Table 6

Percentage Distribution of Teacher
Thoughts Over All Categories

Teacher

Thought Category	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A[a] %	S/S[b] %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD[c] %	L/AP[d] %	S/S %
N[e]	328	343	275	250	319	297	373	352	396	228	267	268	200	292	311	288	176	145	224
Instructional Moves	24.4	24.2	12.7	19.2	18.5	15.8	23.1	22.2	22.7	24.1	19.5	15.3	28.0	23.6	25.4	24.7	20.5	24.1	23.7
Perceptions	20.4	14.6	18.2	16.0	18.5	13.1	14.5	12.5	13.4	12.3	18.7	15.7	13.0	17.1	16.7	15.3	18.2	16.6	15.2
Interpretations	15.5	13.4	16.0	10.8	22.6	19.2	11.8	10.8	17.2	15.8	17.6	20.9	16.5	19.5	17.7	18.1	19.9	17.2	17.9
Expectations	4.6	6.7	4.0	1.2	3.4	7.7	5.9	4.0	1.5	1.8	3.4	9.7	3.0	4.1	7.7	5.6	3.4	2.8	1.8
Meditation-- Pupil	2.1	0.9	1.5	1.2	1.9	0.7	1.1	2.3	0.5	2.2	0.4	1.9	1.5	0.7	1.3	0.3	0.6	0.7	2.2
Self-awareness	5.2	8.7	6.9	11.2	6.3	5.4	7.0	13.4	7.8	9.7	7.9	7.1	8.5	10.6	3.9	4.2	4.5	11.0	6.3
Beliefs	4.3	4.4	3.6	5.2	3.4	7.7	4.6	2.6	4.3	3.5	1.9	1.9	4.0	3.1	6.4	7.6	3.4	6.9	4.5
Objectives	3.0	7.6	4.4	6.0	5.6	9.4	6.7	6.8	6.6	7.5	1.9	1.9	3.0	5.5	2.3	2.4	8.5	5.5	8.5
Lesson Content	6.1	7.6	6.5	5.6	4.1	5.7	4.8	9.4	2.8	9.7	7.1	5.6	4.5	3.4	3.2	1.4	4.0	7.6	6.3
Information-- Pupil	10.1	6.1	14.2	11.6	8.2	10.4	12.6	8.0	13.6	7.0	12.7	10.1	9.5	6.5	10.6	10.4	10.2	5.5	7.1
Information-- Other	1.5	0.6	0.7	1.2	0.6	1.0	0.8	1.7	0.8	0.4	1.5	0.7	1.0	0.7	1.6	3.1			1.8
Feelings	2.7	5.2	11.3	10.8	6.9	3.7	7.2	6.5	8.8	6.1	7.5	9.3	7.5	5.1	3.2	6.9	6.8	2.1	4.9
	99.9	100.0	100.0	100.0	100.0	99.8	100.1	100.2	100.0	100.1	100.1	100.1	100.0	99.9	100.0	100.0	100.0	100.0	100.2

[a]L/A refers to language arts lessons; [b]S/S refers to social studies lessons; [c]L/AD refers to language arts drama and [d]L/AP refers to language arts punctuation. [e]N represents the total number of thoughts reported in each stimulated recall interview.

social studies lesson.

Analysis of the Table indicates that all teachers in all lessons more frequently processed thoughts in the categories of instructional moves, perceptions and interpretations than in any other categories. These three major categories accounted for between 45.5% and 60.3% of all teachers' thoughts. While these three major categories consistently accounted for the majority of teacher thoughts, the categories of meditation--pupil, information--other, expectations and beliefs, consistently received fewer thoughts from all teachers.

A surface analysis of the 12 major categories in Table 6 indicates that there was a general homogeneity concerning the general content of the thoughts and the information processing styles of the nine teachers in the 19 lessons videotaped. Furthermore, Table 6 suggests the teachers' information processing styles were generally consistent for each teacher over the two lessons videotaped.

Each of the 12 categories and their sub-categories are now presented and briefly discussed. In all cases, data from the transcripts are presented to illustrate the sub-categories.

Instructional Moves

This thought unit indicates that the teacher is thinking about an action she had performed, was performing or could perform at a later stage in the lesson or another lesson. An instructional move involves thoughts about action that involve the teacher as the initiator. The teacher's actions involve both verbal and physical actions.

Analysis of Table 6 indicates that overall, more thoughts were coded into the instructional move category than any other category.

The percentage of thoughts in this category ranged from 12.7% to 28.0% of the teachers' total thoughts coded.

The category of instructional moves was further analysed into sub-categories in order to ascertain the substantive components of teacher thoughts about instructional actions. That is, this finer analysis was undertaken to investigate what pedagogical principles, psychological principles and skills the teacher was consciously processing during the interactive phase of teaching. This sub-categorization revealed that teachers sought feedback concerning pupil performance, organized and structured the learning process, were conscious of classroom control and discipline, thought about how they should present information to the pupils, reviewed past learning and evaluated pupil performance. Instructional moves also indicated that the teachers were considering using, or had used, psychological concepts such as repetition, reinforcement, motivation and transfer.

Each sub-category is described and then illustrated with examples from the transcripts. Table 7 presents the percentage breakdown of the sub-categories in instructional moves.

Feedback--Teacher

This sub-category reveals that the teacher is deliberately seeking feedback concerning an individual's or the group's behavior. The teacher might be seeking information concerning task related performance, classroom control and discipline matters or other aspects of the pupils' affective behavior. The teacher often gains the required feedback through questioning or through direct observation. While not often explicitly stated, this monitoring function by the teacher often involves evaluation.

Table 7

Sub-Categorization of Instructional Moves Category

Sub-Categories of Instructional Moves	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	N80	83	35	48	59	47	86	78	90	55	52	41	56	69	79	71	36	35	53
Feedback--Teacher	28.8	9.6	20.0	2.1	27.1	2.1	12.8	14.1	11.1	10.9	27.0	7.3	16.1	5.8	10.1	9.9	5.6	2.9	11.3
Structuring	7.5	13.3	2.9	4.2	5.1	2.1	7.0	5.1	15.6	18.2	11.5	26.8	8.9	5.8	10.1	5.6	13.9	2.9	22.6
Organizing	26.3	22.9	14.3	25.0	18.6	23.4	21.0	38.5	27.8	20.0	23.0	22.0	35.7	31.9	39.2	21.1	44.4	31.4	17.0
Control--Discipline	7.5	8.4	11.4		6.8	6.4	10.5	2.6	4.4	3.6	11.5	12.2	5.4	27.5	3.8	11.3	5.6	2.9	1.9
Presenting	6.3	9.6	8.6	25.0	10.2	14.9	5.8	15.4	12.2	16.4	5.8	19.5	12.5	18.8	2.5	5.6	11.1	22.8	9.4
Reviewing	3.7	3.6	5.7	16.7	5.1	4.3	4.7	2.6						2.9	2.5	1.4		2.9	3.8
Repetition	5.0	7.2	5.7	2.1	6.8	10.6	11.6	5.1	3.3	7.3		4.9	1.8	2.9	5.1	4.2	2.8	11.4	5.7
Reinforcing	2.5	2.4	11.4		3.4	2.1	1.2	2.6	3.3	1.8	3.8		3.6	1.4	3.8			11.4	
Motivating	6.3	6.0	5.7	2.1		12.8	5.8	7.7	2.2	1.8	3.8	2.4		1.4	8.9	12.7	5.6		3.8

Table 7 (Continued)

Sub-Categories of Instructional Moves	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	80	83	35	48	59	47	86	78	90	55	52	41	56	69	79	71	36	35	53
Feedback--Pupil	4.9	3.6			10.2			1.3	3.3	1.8	3.8		9.0	1.4	3.8	8.5		2.9	17.0
Involving	1.2	2.4	5.7				7.0	2.6	10.0		1.9		7.1		3.8			11.4	1.9
Transfer		3.6		6.2			3.5	1.3		14.5					2.5			5.7	
Learning Processes			5.8	6.3	5.1	14.9			3.3	3.6		4.9			3.8	5.6	2.8	2.9	5.7
Miscellaneous		7.2	2.9	10.4	1.7	6.4	9.3	1.3	3.3		7.7					14.1	8.4		
	100.0	99.8	100.1	100.1	100.1	100.0	100.2	100.2	99.8	99.9	99.8	100.0	100.1	99.8	99.9	100.0	100.2	100.1	100.1

Feedback for the teacher serves a variety of functions. As well as indicating the quality of pupil performance, it also serves as one guiding or structuring mechanism that assists in determining future teacher actions.

Some examples of this sub-category, without contextual elaboration, are listed below. Examples listed are representative of the behavior of all teachers unless stated otherwise. Throughout this chapter when references are presented without contextual elaboration teacher is abbreviated to T.

> T 1-1: I was just keeping track of what's going on in the classroom.

> T 1-2: First of all to see if she really had read the story.

> T 3-1: I wanted to see what kind of beginnings some of them had.

> T 6-2: Just to make sure that they really have understood the directions.

Structuring

This sub-category involves the teacher in setting the context for sequences of behavior in the classroom. For example, when she is opening a discussion, or directing attention to an idea or a problem. When she is structuring, the teacher is often focusing the pupils' attentions on some concept, instructions or aspect of the lesson. Often the teacher structures by clarifying or extending pupils' thinking. When structuring, the teacher acts as an initiator of pupil-pupil interaction as well as teacher-pupil interaction.

Some examples of this sub-category, without contextual elaboration, are listed below.

> T 1-1: . . . so I thought I would just tell them I'm going to start again.

T 1-3: I was trying to guide her into the sounding without actually having to do it.

T 3-2: I am trying to get her focused in on that she is the balloon.

T 6-3: I am setting them up, I'm directing a discussion here.

Organizing

This thought sub-category deals with any matter that contributes to the flow of the lesson. It can deal with teacher thoughts concerning the giving out of equipment, allotting time to certain tasks, setting new tasks to be completed and giving directions and instructions. Organizing can refer to specific aspects of the lesson or the lesson as a whole.

Some examples of this sub-category, without contextual elaboration, are listed below.

T 1-1: I should be switching them around.

T 3-1: So I deliberately chose her.

T 3-3: I would have preferred "Amigo" for the time factor.

T 6-1: I was thinking where I would put the screen up.

Control--Discipline

This sub-category deals with teacher thoughts about moves she has taken or will take to deal with unacceptable behavior in the class-room. The behavior the teacher could be directing her attention to includes pupil noise, lateness for class, rudeness and inattention.

Some examples of this sub-category, without contextual elaboration, are listed below.

T 1-3: I called to them right away instead of allowing them to cause a big disruption for us.

T 3-1: So I was prepared to put the lid on him before he got

very far.

T 6-1: You have to be rude like that with him or he won't
shut up.

T 6-2: . . . and it's no use trying to harangue him any more
about it.

Presenting

This sub-category reveals the teacher's thoughts about pre-
senting content information to the pupils. The thoughts could be
concerned with the presentation of information through verbal, written
means or through the use of any audio-visual equipment.

Presenting also involves the teacher skills of demonstrating
and explaining.

Some examples of this sub-category, without contextual
elaboration, are presented below.

T 1-2: And it was introductory, a new idea about fossils.

T 3-1: . . . and I was going to tell the children that.

T 3-3: . . . and I was trying to do my bit and tell them.

T 6-1: I was going to go back and read what it said in the
dictionary.

Reviewing

This sub-category refers to when the teacher's thoughts are
concerned with practising in a variety of contexts work that had
previously been taught. It also involves relating work previously
taught with what has most recently been taught. It is a much broader
concept or skill than mere repetition and is used throughout the
various phases of a lesson.

Some examples of this sub-category, without contextual
elaboration, are presented below.

T 1-1: It was just introducing the whole thing of dinosaurs again.

T 1-2: At this point in the lesson I felt that we had reviewed what we had already talked about yesterday.

T 3-1: . . . and right there I was trying to bring in a review.

T 6-3: I want to sum up the lesson I want to discuss and go over it.

Repetition

This thought sub-category relates to the teacher's behavior when she, for example, is repeating instructions or drilling some skill or concept. The teachers in this study often used the words, "reinforcing," "emphasizing," and "stressing" to indicate their use of repetition as a teaching skill. Repetition also relates to the fact that the teacher has the pupils repeat instructions, a skill or some concept. Underlying both uses of repetition was the belief that repetition facilitated learning. This belief concerning repetition is discussed in the section of this chapter dealing with the category of thoughts labelled beliefs.

Some examples of this sub-category, without contextual elaboration, are presented below.

T 1-2: . . . and I have them do this every day.

T 1-3: Just to reinforce it, that the name of it was baby.

T 3-2: So this is why I reinforced the fact you are a balloon.

T 6-2: You have to stress at this stage especially, constantly repeat instructions.

Reinforcing

This sub-category of thoughts refers to the teacher's use of positive reinforcement. Positive reinforcement refers to the

rewarding of a behavior which increases the probability of that behavior occurring again. The teachers in this study reinforced pupil behaviors by rewarding them verbally with praise, or occasionally using physical contact such as a hug.

Some examples of this sub-category, without contextual elaboration, are presented below.

T 1-2: . . . like a quick hug or whatever is fine.

T 3-1: So I wanted to praise him at this point, kind of work that in.

T 3-2: She needs that kind of reassurance when you can really recommend what she has done.

T 6-1: I praised them a couple of times.

Motivating

This sub-category refers to when the teacher's thoughts reveal she is deliberately attempting to motivate the pupils to become involved, interested or enthused about the lesson or some aspect of the lesson. The teachers primarily used verbal behavior to motivate their pupils and drew upon known interests of the pupils, such as their interest in some aspect of a subject or some specific concept. Both intrinsic and extrinsic motivation were used.

For example:

T 1-1: . . . and then I threw in Tyrannosaurus.

T 1-2: And when I read to them I try to make it sound interesting.

T 3-1: . . . again it was just motivation to say that here are a few kids that are going gung ho, why don't you get started, kind of thing.

T 6-2: Just to peak their interest a little bit before I say one.

Feedback--Pupil

This sub-category involves the teacher in giving the pupil feedback concerning his or her achievement. Eight of the nine teachers employed instructional moves designated as feedback--pupil. Feedback was, in most cases, given to the pupils orally. Feedback given was both positive and negative and related to both academic and affective behavior.

Some examples without contextual elaboration are presented below.

T 1-3: I said to her, "You have too many r's in it."

T 3-1: . . . and at that point there I was trying to let her know that I was holding no grudges.

T 6-1: Let them know they're slowpokes, they should have them done.

T 6-2: So I always draw, point out the things that can be improved upon.

Involving

This sub-category refers to when the teacher is consciously thinking about involving a pupil or pupils in the lesson. Teachers involved pupils in lessons for a variety of reasons. First of all, it was considered that pupils "learned by doing," secondly, it was believed that by involving pupils in a lesson, attention and motivation would be maintained, and thirdly, certain pupils were called upon by the teacher to speed the flow of the lesson.

Examples of involving include the following:

T 1-1: Give them a chance to say what they know.

T 3-1: I chose them deliberately to start the story, to get it off on the right track.

T 6-1: I thought it might wake him up to get him into it
        again.

T 6-3: Trying to get more people involved.

Transfer of Learning

Six of the teachers in this study were consciously aware of
transfer of learning and indicated their understanding that for
transfer to take place, stimulus generalization, that is, the trans-
ference of a response from one stimulus to a similar stimulus should
be provided for, or, the transference of a similar response for
another response in the face of a single stimulus (response
generalization), should be provided for.

Teacher 1-1 illustrated a concern for transfer of learning
when, after a social studies discussion, she wanted the children to
apply in their work book exercises the concepts discussed earlier.
She stated, "they should have been doing something at their desks
with following up in their books what we'd talked about."

Teacher 1-2 who was keen to have reading skills practised in
every subject area, supported this objective when she commented in her
social studies lesson, ". . . whenever I can I try to get books into
everything . . ." Later in the same social studies lesson she
indicated thinking, "there again is where I wanted to get the books
into it."

Teacher 3-2 indicated during her social studies lesson
thinking about transfer of learning when she pointed out, "I was
relating it over to the language arts," and again later in the lesson,
". . . and I thought it was a good way to make the correlation then,
to see if they've learnt anything too."

Learning Processes

This sub-category has a number of sections that reveal the teachers were thinking about how children learn. These instructional moves focused on the learning process and included thoughts about learning being meaningful, pupils learning through association and discrimination, through problem solving (discovery learning) and through the teacher using a variety of modes of presentation (variation in presentation of stimuli). It should be emphasized that while these processes of learning are important, the teachers were also cognizant of other concepts discussed earlier (for example, repetition, reinforcement) that are important to and an integral part of the learning process.

Some teachers attempted to make learning meaningful by concretely relating the concepts being discussed to the pupils' own experiences. Teacher 1-3 illustrated this concept on a number of occasions in her social studies lesson. For example, when discussing baby animals, she stated, "Give them the most familiar ones first . . . . Yes, I wanted to pick out the animals that probably they're most familiar with." Teacher 1-2 in presenting a new concept stated, "So of course I used that because they'd all be familiar with the characters and so on."

Instructional moves involving learning through cues that developed associations were also revealed by three of the teachers in the study. Teacher 1-1 illustrates this process when she stated, "What's something else with tri in it, something with, what had three wheels you ride on? . . . and we looked at tricycle and triangle and again at the three horns on the Triceratops."

Learning through problem solving was indicated in the instructional moves of six of the teachers. Teacher 1-3 in her social studies lesson posed a problem for the class to solve and, rather than give the pupils the answer, she gave clues to assist them to solve the problem. This teacher commented, "I was going to have to give them a clue that was more evident . . . instead of just telling them it was a feather." In her social studies lesson, teacher 6-2 commented when she gave some new work to the pupils, "Like the first day that I introduce a map I like them to look the map over and to try and find the places themselves."

Five of the teachers indicated that presenting information through a variety of modes facilitated learning. For example, teacher 1-1 orally presented some social studies concepts to her class, and then placed them on the chalkboard for the pupils to see. She explained, "so they should be up on the board . . . and just to make it easier for them."

Miscellaneous

Instructional moves in this sub-category were related to various areas of the teaching-learning process and included thoughts about maintaining-enhancing student self-concept, class atmosphere, individualizing instruction and pupil involvement in decision making.

Self-concept maintenance-enhancement was important for teacher 3-1 in her language arts lesson and teacher 6-2 in her social studies lesson. Both lessons involved the discussion mode of presentation.

Teacher 3-1 illustrated instructional moves involving self-concept when she stated, "So I was still trying to get a good story without hurting anybody's feelings," and also, "but I dont' want to

criticize their ideas and say, 'No, that wasn't a good one'." Teacher 6-2 indicated how she used instructional moves to maintain-enhance student self-concept when during a social studies quiz that involved a class competition, she commented, "I tried to, depending on the child who I was asking too, I tried to pick one they should be able to get." In this same lesson teacher 6-2 also indicated through instructional moves her concern with class atmosphere. When an undercurrent of tension was creeping into the competition, teacher 6-2 joked with the class to, ". . . just sort of to lighten it up again."

Conscious efforts to individualize instruction through instructional moves were made by four teachers. Teacher 1-2 illustrated this in her social studies lesson when she was helping a student, "I was trying to show that it was in the index . . . and now I wouldn't normally show that to every child."

The final type of instructional move in this section relates to pupil decision making. Teacher 3-3 in her language arts lesson involved the pupils in decision making when they were given responsibility to choose the stories to be read. This teacher had the pupils vote on the final choice and commented, ". . . if it's going to be their choice it's the only way I can do it."

Perceptions

This category is one in which the teacher reports a sensory experience and includes what the teacher sees, hears, smells, or feels. Table 6 indicates that for the nine teachers between 12.3% and 20.4% of their thoughts were devoted to perceptions. Perceptions were further analysed in order to ascertain what stimuli the teacher was

aware of in the classroom. This sub-categorization revealed that teachers' perceptions centred on eight major aural or visual points of focus in the classroom. Teachers were aware of student academic performance, student verbal behavior, student gross movements, student subtle moves such as facial expressions, student presence or absence, student noise and misbehavior, equipment and materials, and a variety of miscellaneous stimuli.

Each of these sub-categories is now briefly described and illustrated. Table 8 presents the percentage of thought units in each sub-category.

Academic Performance

This sub-category indicates that the teacher is showing awareness of the pupil's work-related performance. The teacher actually sees the pupil's work, or through an answer to a question, hears the pupil produce an academic performance. For example, teacher 1-1 when viewing a pupil's worksheet commented, ". . . and he did, he got them all right," while teacher 3-1 in her language arts lesson noted, "He's told me the whole story in three sentences."

Student Verbal Behavior

This sub-category refers to when the pupils are talking, commenting or asking the teacher questions. It does not refer to when the pupil is answering a teacher-initiated work question, this type of verbal behavior is sub-coded as academic performance. Teacher 6-1 indicated her awareness of pupil verbal behavior when she commented, "There's that same old question again," while teacher 6-2 indicated her awareness of student verbal behavior when she stated, ". . . and

Table 8

Sub-Categorization of Perceptions Category

Sub-Categories of Perceptions	Teacher 1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
	N67	50	50	40	59	39	54	44	53	28	50	42	26	50	52	44	32	24	34
Academic Performance	25.4	32.0	24.0	35.0	45.8	35.9	44.4	27.3	24.5	28.6	18.0	14.3	46.2	34.0	59.6	38.6	78.1	41.7	44.1
Student Verbal Behavior	29.9	30.0	20.0	27.5	16.9	35.9	7.4	27.3	18.9	17.9	26.0	45.2	19.2	22.0	7.7	34.1	9.4	8.3	11.8
Student Movement	10.4	8.0	10.0	10.0	13.6	7.7	25.9	6.8	15.1	17.9	20.0	11.9	11.5	18.0	5.8	6.8	3.1	4.2	17.6
Student Expression	3.0		4.0	2.5	1.7			4.5	1.9		4.0					2.3		8.3	
Student Presence-Absence	7.5		4.0								2.0			4.0	1.9	6.8		4.2	
Noise-- Unacceptable Behavior	9.0	6.0	8.0		5.1	7.7	11.1	9.1	11.3		4.0	11.9	7.7	12.0	3.8	2.3			5.9
Equipment-- Materials	13.4	12.0	18.0	12.5	15.3	7.7	5.6	4.5	5.7	14.3	18.0	7.1		4.0	9.6	6.8	6.3	12.5	14.7
Miscellaneous	1.5	12.0	12.0	12.5	1.7	5.1	5.6	20.5	22.6	21.4	8.0	9.5	15.4	6.0	11.5	2.3	3.1	20.8	5.9
	100.1	100.0	100.0	100.0	100.1	100.0	100.0	100.0	100.0	100.1	100.0	99.9	100.0	100.0	99.9	100.0	100.0	100.0	100.0

she answered very quickly."

Student Movement

The perceptions that were placed in this sub-category refer to gross student movements such as the student walking around the room or putting equipment away. For example, teacher 1-1 in her language arts lesson noted, ". . . and he was trying to rewind the film strip," while teacher 6-1 commented when a boy came to assist her with some equipment, "That boy volunteered to put it up."

Student Expression

This sub-category refers to subtle student movements the teacher notices and include a pupil's frown, smile, gesture or eye movement. This sub-category occurred infrequently as student expressions were commented on in only 9 out of the 19 lessons video-taped. Teacher 1-1 illustrated this sub-category when she commented on pupil frustration and the fact that, "they sort of go 'huh'!" while teacher 6-2 in a language arts lesson was conscious of pupil posture and pupil eye movements during the course of the lesson, ". . . slouching a little bit more, their eyes brighten all of a sudden." This teacher monitored the "expression" in pupils' eyes as it told her whether the pupils were understanding the lesson.

Student Presence-Absence

This sub-category indicates the teacher was sensitive to the presence of absence of a pupil. She may have noted that a pupil was absent from school for the complete day or was not present for part or the whole of a particular lesson. For example, teacher 6-1 noted, "but the girls had come in late," while teacher 6-2 noted, ". . . and I

knew X was away."

Noise--Unacceptable Behavior

This sub-category refers to when the teacher is aware of excessive noise in the classroom or of pupils misbehaving. For example teacher 1-1 commented, "You can hear the kids with the record player again coming through there," while teacher 3-1 stated, "X was goofing around."

Equipment--Materials

This sub-category refers to when the teacher notices and reports her thoughts on some piece of equipment or materials in the classroom. For example, teacher 6-1 noted, "the numbers weren't quite right on the map," while teacher 6-3 noting a social studies display, commented, "and there's quite a display there."

Miscellaneous

This sub-category refers to happenings such as when other teachers come into the room, when the teacher comments on her "total" classroom environment or when she notes some instructional decision made by the students. For example, teacher 3-1 in her language arts lesson noted, "But they all voted against me," while teacher 6-1 in her social studies lesson revealed an awareness of the time of the year influenced the way in which she structured a unit of work. She commented, " . . . because we're getting towards the end of the year too."

<u>Interpretations</u>

Interpretations are thought units in which the teacher attaches meaning or explanation to a perception. Table 6 reveals that teacher interactive thoughts in this category ranged from 10.8% to 22.6% of the teachers' thoughts sampled during the stimulus lessons. Teacher interpretations were further analysed in order to ascertain what pupil behaviors and other phenomena teachers attached meaning to. Sub-categorization revealed that teachers' interpretations could be classified into eight major sub-categories. Table 9 indicates that the sub-categories receiving most emphasis across the 9 teachers in the study were interpretations of student academic performance, attention--motivation, student movement, student verbal behavior, student cognitive processing, materials and content, and student feelings.

Each of the eight sub-categories is now briefly described and illustrated with examples from the stimulated recall transcripts.

<u>Academic Performance</u>

This sub-category occurs when the teacher places an interpretation on a pupil's work related performance. The interpretation can apply to either individual or group performances and can be in response to a teacher's perception of pupils' written work or verbal behavior. Quite often, the interpretation takes on an evaluative connotation. For example, teacher 1-1 commented on a pupil's oral reading, ". . . that it really showed he had practised." Teacher 6-3 after observing some pupils' books and asking some recall questions, commented, "They don't seem to understand that thing. They don't understand the

Table 9

Sub-Categorization of Interpretations Category

Sub-Categories of Interpretations	Teacher																			
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %.	L/A %	S/S %	L/AD %	L/AP %	S/S %
	N51	46	44	27	72	57	44	38	68	36	47	56	33	57	55	52	35	25	40
Academic Performance	31.4	45.7	34.1	37.0	31.9	36.8	43.2	21.1	30.9	33.3	17.0	19.6	42.4	38.6	40.0	25.0	65.7	44.0	65.0
Student Attention--Motivation	11.8	8.6	2.3	3.7	15.2	10.6	15.9	13.2	16.1	11.1	17.0	28.6	6.1	14.1	5.4	9.6	2.9	16.0	5.0
Student Movement	9.8	4.3	9.1	7.4	8.3	7.0	20.5	13.2	10.3	5.6	10.6	7.1	6.1	15.8	12.7	5.8			7.5
Verbal Behavior--Noise	9.8	4.3	9.1	3.7	8.3	7.0	2.3	18.4	11.8	8.3	10.6	14.3	9.1	14.0			5.7	4.0	5.0
Student Cognitive Processes	11.8	15.2	4.5	11.1	15.3	8.8	2.3	2.6	7.4	8.3	2.1	7.1	9.1	5.3	18.2	34.6	5.7	8.0	5.0
Materials--Content	13.7	4.3	11.4	14.8	2.8	8.8	2.3	5.3	7.4	22.2	27.7	7.1	6.1	5.3	7.3	1.9	8.6	12.0	5.0
Feelings	5.9	6.5	22.7	11.1	11.1	12.3	6.8	13.2	13.2	5.6	6.4	5.4	12.1	3.5	9.1	17.3	8.6	8.0	5.0
Miscellaneous	5.9	10.9	6.8	11.1	6.9	8.8	6.8	13.2	2.9	5.6	8.5	10.7	9.1	3.5	7.3	5.8	2.9	8.0	2.5
	100.1	99.8	100.0	99.9	99.8	100.1	100.1	100.2	100.0	100.0	99.9	99.9	100.1	100.1	100.0	100.0	100.1	100.0	100.0

geography."

Student Attention--Motivation

This sub-category refers to the teacher's interpretation of the pupils' states of attention to or interest in the work being undertaken. For example, teacher 6-1 interpreted that her pupils were paying attention in a social studies lesson when she stated, ". . . so they were concentrating on that." However, in her language arts lesson she interpreted lack of student attention when she commented, ". . . and nobody was listening at all."

Teacher 3-1 illustrated her interpretation of whether pupils were or were not motivated when she stated in her language arts lesson, ". . . but they must have been interested in it the day before to remember."

Student Movement

Teachers monitored pupil gross movements in the room and placed interpretations on these movements when it was not obvious what the pupil was doing. For example, when watching a pupil rewind a film strip in her language arts lesson, teacher 1-1 commented, ". . . and he was going to put it away I presume." However, in a social studies group activity teacher 6-2's interpretation was more evaluative when she remarked, "At that point I thought they were moving around quickly."

Verbal Behavior--Noise

This sub-category refers to interpretations that teachers place on verbal behavior that is not academically oriented. It also refers to verbal noise that interpretations are placed upon. For example, teacher 6-1 when commenting upon pupil noise in her social studies

lesson stated, ". . . because to me a lot of it means that they're not really working." When dealing with a pupil's response she did not quite hear in her language arts lesson, teacher 1-1 commented, "I think he said something funny."

Student Cognitive Processes

This sub-category refers to interpretations the teacher places on the pupils' thoughts, and general cognitive processing. For example, teacher 6-2 commented in her language arts lesson when watching students work through a group exercise, "I think they were trying to figure out the spelling of 'significant'." Teacher 1-1 illustrated this sub-category in her language arts lesson when she commented on a pupil's performance, "He connects it right away in his mind."

Materials--Content

Throughout all lessons, teachers placed interpretations on the difficulty or suitability of the materials the pupils were working with. These interpretations were made relative to the teacher's interpretation of the group's or individual's ability. For example, teacher 6-3 in her social studies lesson commented, "I mean Rome and Carthage don't mean a damn to them." Teacher 6-1 in her social studies lesson, looked at a map and stated, "I know it would serve the purpose."

Feelings

All teachers placed interpretations upon pupil emotions. These interpretations were based upon facial expressions, eye movements and gross body movements. For example, teacher 6-1 in her language arts lesson assisted a pupil who "looked puzzled" and could not understand a concept. She commented, "He was quite concerned about

that for some reason." Teacher 6-2 in her language arts lesson
commented while watching a group activity, "They were still enjoying
it."

Miscellaneous

This sub-category generally refers to interpretations the
teacher places upon the pupils' classroom behavior, their home
backgrounds and school organizational matters. For example, teacher
6-2 illustrated this sub-category on a number of occasions in her
language arts lesson. When referring to where pupils prefer to sit
in a classroom, she stated, "Of course they all like to sit at the
back," and when commenting on a new boy to the class she stated, "I
guess he's just had a lot of problems adjusting around." Teacher 3-1
in a language arts lesson, when observing some pupils sitting in a
group near her commented, "And I don't know why it hit me there, but
the ones I find that don't get the attention at home, are what I would
suppose, say neglected at home."

Expectations

Expectations are thought units that refer to pupil behavior
the teacher expects or anticipates will occur in the lesson. Table 6
indicates that expectations accounted for between 1.2% and 9.7% of the
thoughts expressed by the teachers in the 19 lessons videotaped for
stimulated recall purposes. When this thought unit was analysed for
sub-categories, it was found that three sub-categories were clearly
definable: task performance, cognitive performance and affective
performance. The occurrence of these sub-categories is presented in
Table 10.

Table 10

Sub-Categorization of Expectations Category

Sub-Categories of Expectations	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	N15	23	11	3	11	23	22	14	6	4	9	26	6	12	24	16	6	4	4
Task Performance	53.4	26.1	18.2		27.3	47.8	27.2	7.1	16.7		44.4	23.0	50.0	66.7	33.4	18.8	33.4		50.0
Cognitive Performance	33.3	69.6	63.6	100.0	27.3	43.5	59.1	71.4	83.3	100.0	22.2	15.4	33.3		62.5	56.3	33.3	100.0	50.0
Affective Performance	13.3	4.3	18.2		45.5	8.7	13.6	21.4			33.3	61.5	16.7	33.3	4.2	25.0	33.3		
	100.0	100.0	100.0	100.0	100.1	100.0	99.9	99.9	100.0	100.0	99.9	99.9	100.0	100.0	100.1	100.1	100.0	100.0	100.0

Task Performance

This sub-category refers to the expectations that a teacher has for a pupil or pupils on an instructional task. It does not refer to how well or poorly the teacher expects the pupils to perform, but instead refers to the physical performance of the task, for example, how quickly the task might be performed. This sub-category also refers to expected content or experiences the teacher anticipates will be associated with the task. Some examples will illustrate this sub-category.

Teacher 1-1 when giving some pupils a reading task to complete, expected "Some of them will be finished in a hurry." On the other hand, she also expected that, "Some I know will not even open their books when they're supposed to be reading." Later in the same lesson she commented as a boy was about to speak, "and I was afraid he was going to go off on a tangent."

Teacher 1-3 when thinking about a proposed field trip to a farm stated, ". . . and there would probably be quite a smell" and that, "I anticipate seeing a fairly big horse, a big work-type horse."

Cognitive Performance

This sub-category refers to the results of the pupil's performance on a task and generally refers to whether an answer was correct or incorrect or whether it was not given at all. For example, in response to a question in her social studies lesson teacher 1-2 responded with, "I didn't anticipate that kind of answer." Teacher 3-1 in her language arts lesson commented on the pupils' responses to a problem she asked by stating, ". . . so I figured this would come very quickly to them." Later in the same lesson she commented, "I

could tell at this point the story wasn't going to develop very well."

Affective Performance

This sub-category refers to affective behavior the teacher expects will or will not occur with a pupil or pupils. Teacher 3-1 illustrated this sub-category on a number of occasions in her social studies lesson. For example, when showing the class some Japanese clothing she stated, ". . . because I knew they would laugh at the sleeves." However, on occasions the teachers' expectations are not fulfilled. Teacher 3-3 was disappointed when her class did not react with enthusiasm to a picture she was showing them in social studies. Her thoughts revealed this when she said, ". . . and I thought they'll look at this and go 'Wow!'."

This category also deals with expected pupil misbehavior. For example, teacher 6-1 in her social studies lesson commented, "X came in, I knew I was going to have trouble with that one boy."

Meditation--Pupil

Few thoughts were contained in this category for any teacher in any lesson. Table 6 reveals that teacher thoughts in this category ranged between 0.3% and 2.3% of teachers' thoughts in the lessons videotaped. In this category the teacher is showing concern with pupils' mental processes and is concerned how and why pupils remember or forget something.

Occasionally, a teacher was surprised by a pupil's comment or response to a question and deliberated on the pupil's mental processes. This can be illustrated by an example from teacher 1-1's social studies lesson:

T: How did she remember that?

The teacher went on to report:

T: I was amazed, we'd talked about that one once way back, somewhere, . . . and we hadn't even talked about that one recently.

Teacher 1-3 in considering a pupil's mental processes reported:

T: . . . and I was thinking to myself at the time how a child would immediately react to that. How would he know that it was a mirror?

Teacher 3-2 brought up the problem of pupil attention/ inattention when she reported:

T: . . . you can't always tell with kids you know, whether they are truly inattentive or whether they're just mulling over what had been going on.

Teacher 1-3 towards the end of her social studies lesson indicated her concern with what was going on in her pupils' heads:

T: . . . because after this long discussion you don't really know what stays in the head.

This concern motivated this teacher to close her lesson by reviewing the key facts that had previously been discussed. She reported:

T: And so we just took all the facts and put them together as a neat little kit.

Self-Awareness

This thought unit indicates the teachers are thinking about their own behavior. They are conscious of the various facets of their performance in the classroom and indicate awareness of this behavior as they interact with the pupils. This awareness involves evaluation and emotions about one's performance, deliberations on instructional strategies and reflections on lesson content as well as on one's

personality, appearance and general teaching style.

The percentage of teacher thoughts in the category self-awareness ranged from 3.9% to 13.4% of the teachers' total thoughts. When this category was sub-categorized to investigate the substantive components, it was found that there were six sub-categories within the unit. These sub-categories which are defined and illustrated below are summarized in Table 11.

Instructional Awareness

This sub-category expresses a thought unit that indicates the teacher is consciously aware of her instructional strategies, why she was using them and the possible consequences of them. Instructional awareness includes not only thoughts about instructional tactics but also thoughts about lesson organization. Some examples of this sub-category, without contextual elaboration are listed below.

T 1-2: That's when I wish I were two people or three.

T 3-1: I hadn't planned it when I started this lesson.

T 6-3: I was saying to myself at that time "Gees they're going to get these two confused'."

Instructional Evaluation

This sub-category refers to when the teacher is passing judgement on her own performance during individual instructional acts or upon the lesson as a whole. Judgements included both positive and negative statements about the teacher's performance. For example:

T 1-3: I kind of thought to myself, that was a good way of teaching that sound.

T 3-1: I thought it went rather well.

T 6-3: I'd blown it and I had known that I had blown it.

Table 11

Sub-Categorization of Self-Awareness Category

		Teacher																			
		1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Sub-Categories of Self-Awareness		L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
	N	17	30	19	28	20	16	26	47	31	22	21	19	17	31	12	12	8	16	14
Instructional Awareness		41.2	23.3	26.3	14.3	30.0	37.5	50.0	27.7	45.2	31.8	28.6	31.6	35.3	32.3	33.3	33.3	75.0	18.8	28.6
Instructional Evaluation			13.3	10.5	21.4	15.0	6.3	19.2	8.5	16.1	13.6	23.8	21.1	47.1	35.5	41.7	16.7		43.8	7.1
Instructional Reflection		17.6	13.3	21.1	25.0	25.0		19.2	25.5	6.5		14.3	5.3	5.9	3.2	8.3	8.3	12.5	18.8	7.1
Content Reflection		17.6	23.3		28.6	5.0	25.0		19.1		9.1	14.3	21.1	5.9	9.7	16.7	25.0		6.3	21.4
Personal Reflection		23.5		21.1	10.7	20.0	31.3	11.5	19.1	25.8	9.1	19.0	10.5		16.1		16.7	12.5	6.3	35.7
Affective Dissonance			13.3	21.1		5.0				6.5	36.4		10.5	5.9	3.2				6.3	
		99.9	99.8	100.1	100.0	100.0	100.1	99.9	99.9	100.1	100.0	100.0	100.1	100.1	100.0	100.0	100.0	100.0	100.3	99.9

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Instructional Reflection

This sub-category refers to when the teacher is consciously deliberating an intended course of action and is in the process of decision making. This sub-unit also refers to when the teacher is reflecting upon whether the pupils are or are not paying attention or understanding the work being dealt with. For example:

T 1-1:   . . . and whether I should go get her.

T 3-1:   At this point I was trying to decide whether I should turn around and give them all heck.

T 6-2:   . . . and trying to figure out whether I'm surprised at how well the child is doing or not surprised at how well he is doing.

Content Reflection

In this sub-category the teacher is generally showing her awareness of a lack of subject matter knowledge or mistakes that she may have made in the presentation of subject matter. For example:

T 1-1:   Well I didn't know, I couldn't name a figure.

T 3-3:   . . . and I didn't know exactly where in the book.

T 6-3:   I am trying to think of the answers.

Personal Reflection

In this sub-category the teacher shows awareness of her personality, appearance, and general teaching style. At times she reflects upon how she might be appearing to the pupils. For example:

T 1-2:   I wonder if I look grouchy when I do that?

T 3-2:   . . . and I have a basic claustrophobic personality.

T 6-1:   I just don't have the patience, you know.

Affective Dissonance

This sub-category refers to when the teacher expresses emotions about her own teaching performance. In most cases the teacher is expressing dissatisfaction concerning some aspects of her instructional strategies or her lack of content knowledge. Emotions concerning the performance of the pupils are classified into the feelings category.

For example:

T 1-1: . . . and I hate doing that.

T 3-2: I get annoyed with myself when I do things like that.

T 6-1: I sort of did feel bad about not following it up.

Beliefs

A belief is defined as the mental assent to or acceptance of anything as fact or truth on the ground of testimony or authority. It is a statement or state of affairs on the basis of which one is willing to act.

In this study the beliefs cited were statements by teachers about the characteristics of children and the behavior of children. These statements often alluded to how children are motivated, learn and remember. On other occasions the statement had a developmental base and referred to behavior the teacher considered typical of a particular age group.

Teachers also cited beliefs that referred to guiding assumptions about general pedagogical practices that the teachers had incorporated into their repertoire of behaviors. When the teachers were making reference to their beliefs, they invariably used non-technical language whether the belief was a general pedagogical one or

one that was psychologically based.

Table 6 reveals that the percentage distribution of teacher beliefs ranged between 1.9% and 7.7% of the nine teachers' thoughts in this study. Because of the small number of beliefs that were revealed in the teachers' interactive thoughts, beliefs have not been sub-categorized and presented in a table on a percentage distribution basis. Instead, the raw frequencies only have been presented in table form.

Table 12 reveals that the teachers held general pedagogical beliefs, beliefs related to students' stages of cognitive development, general beliefs concerning how learning "best" took place, beliefs about the use of principles which are important in the learning process, beliefs about pupils' social development, personality and individual differences, and beliefs about memory as well as about general psychological principles.

It is recognized that it is difficult and often not logical to make distinctions between different aspects of the learning process. However, in order to facilitate discussion, general aspects of learning and specific principles will be presented separately, and relationships made when it is necessary to clarify the discussion.

It should be stressed that the beliefs the teachers cited were revealed in their thoughts and came from only two lessons per teacher. Because of this fact, one cannot say that these are the only beliefs a teacher has concerning the teaching-learning process. One cannot also assume, that because a belief was only mentioned once the teacher considers it a less important belief than one mentioned five times. It is beyond the scope of this study to investigate the relative

Table 12

Frequency Sub-Categorization of Beliefs Category

Sub-Categories of Beliefs	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/AD	L/AP	S/S
N	14	15	10	13	11	23	18	10	17	10	5	5	9	9	21	24	7	11	10
General Pedagogical	2	3	4	1	1	4	6	3	6	1	3	5	7	3	6	7	1	1	3
Developmental	2	2	3	5	2	3	4	3	4	1			1	1	2	2			
General Learning (i) Active Involvement (participation)	5	2			1					1				4				1	
(ii) Variety of Modes (stimuli)	1			1	1		2											1	
(iii) Repetition			1	1	1	5				2	1		1		2	1		3	2
(iv) Problem Solving						2		1											
(v) Meaningful		1				2		1	4	3				1	1		4	1	3
(vi) Concrete Experiences		1													3			1	1
Specific Learning Principles (i) Reinforcement	1			2	3				2						3	1			

Table 12 (Continued)

Sub-Categories of Beliefs	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/AD	L/AP	S/S
	N14	15	10	13	11	23	18	10	17	10	5	5	9	9	21	24	7	11	10
(ii) Attention		1								1									
(iii) Motivation	1					2	2	1								1	1		
(iv) Self-Concept	1			1		3	1				1					7	1	1	1
(v) Transfer	1		1	1	2	1									2			1	
(vi) Cognit-ive Feedback																2			
Memory (i) Memory (General)		1		1				1							1	1		1	
(ii) Association		2								1						2			
General Psychological Principles (i) Social Development			1				2												
(ii) Individual Differences						1													
(iii) Personality									1									1	

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importance teachers attach to certain beliefs. The intent is
specifically to report those beliefs the teachers revealed during the
interactive phase of teaching that guided their behavior during the
lessons videotaped.

General Pedagogical Beliefs

General pedagogical beliefs were expressed by all teachers in
all the lessons videotaped. These beliefs dealt with the general role
of the teacher, the role of the teacher in specific teaching-learning
situations and general beliefs about pupils.

Six of the nine teachers believed that it was important to
relate to pupils on a "personal level" so that teachers would be
perceived as people with strengths, weaknesses and emotions who were
readily approachable by the pupils. When revealing this belief,
teacher 1-2 indicated she believed in relating personal anecdotes to
her pupils because, "I think it makes them think that I'm more a real
person, that does normal sorts of things . . . I'm a person not just a
teacher." Teacher 6-2 explained the importance of developing personal
relationships with pupils by stating, "And I like to bring my own
experiences into it, so that the kids can sort of identify with me,
I'll often say, almost call myself down in certain situations to make
them look better, and that was a situation." The practical expression
of these beliefs concerning the teacher's role is found in the
principle of teacher authenticity discussed later in this chapter.

Other beliefs relating to the general role of the teacher
revealed that absolutely quiet classrooms were undesirable and that the
teacher should not have favourites but should treat all pupils equally
in all situations.

Teacher 3-1 when mentioning classroom noise explained, "I believe there is noise that's busy noise, that's good noise." Teacher 6-1 mentioned three times in her language arts lesson a belief in not having favourites and in treating pupils equally. When explaining why she went down the rows when asking questions, this teacher stated, "Because I think that then they get a chance, each one of them has a chance to give their answer right or wrong and we can talk it over." This belief was again expressed in the lesson when the teacher declined to respond to a pupil's comment and explained, "I don't like to do that unless I can ask everybody." The practical expression of this belief has been described as the principle of equality of treatment.

Beliefs concerning the role of the teacher in specific teaching-learning situations were expressed by all teachers. Generally these beliefs centred on how teachers should conduct discussion sessions or manage group activities. For example, when conducting discussion sessions teacher 1-1 believed that all those who wanted to participate should get an opportunity, "Why should some get a chance and some have something, it's all important to them whatever it is they have to say." However, while considering it important for pupils to participate, teacher 1-1 believed one "can't force them to be interested," and to achieve the discussion's objectives, "not all kids' comments have to be responded to or we'd never stop." Teacher 6-3 believed that in discussion sessions the teacher should, "try not to over-dominate," and that shy or withdrawn pupils should be involved in the discussion, "I am trying to draw these people in."

During small group activities teacher 1-3 believed that it was

preferable to overlook small work-related errors rather than disturb the harmony of the group at work. She explained:

> I thought to myself, it's kind of funny how at that time that would have happened instead of what I wanted to see happen, didn't happen, and yet at the same time I didn't want to put a damper on the game because they seemed to be getting on so well so I just kind of wandered off and let them continue on with their game. Because often interruptions distract them completely.

General beliefs concerning the behavior of children were expressed by all teachers. For example, teachers believed that pupils had certain expectations concerning the teacher's behavior and that this influenced teacher-pupil interaction. This is illustrated by teacher 1-3 who explained, ". . . and they've learned a lot about me this year, they know just what I would do, what I won't do and about how far to take it," while teacher 3-3 stated, "Well he knows me well enough by this time of the year to know that I will eventually get to that or I would get to that after we finished discussing this."

Developmental Beliefs

All except teachers 3-3 and 6-3 expressed beliefs that were sub-categorized as developmental. These beliefs were stated in general terms and referred to behavior that was considered appropriate for, or typical of a certain age group.

The beliefs generally referred to how a pupil's stage of development influenced the learning process or his personality. For example, teacher 1-1 indicated a belief in the short attention span of 6 year olds, "at that age level they're not going to just sit and have somebody talk to them for half an hour or 10 minutes." This belief was also expressed by teacher 6-2, "after you've done maybe 20 minutes of the same thing, the attention span of children at elementary school

level starts to wander, no matter what they're doing."

Certain personality characteristics of a group were also attributed to the group's stage of development. Teacher 3-2 disciplined some pupils who pushed in front of another group and attempted to monopolize the conversation with her. She commented, "I find at the beginning of Grade 3, they're still so egocentric, that only they matter, that only their comments matter." This same teacher in another lesson referred to a group personality characteristic when she stated, "They have a black and white attitude that it's either totally right or totally wrong."

Teacher 3-1 also referred to beliefs concerning the influence of developmental stages upon pupils' personality characteristics. For example, when referring to the use of "baby words" teacher 3-1 commented, "And of course they try to be very sophisticated in Grade 3, so they don't like to use them either."

General Beliefs Concerning Learning

The nine teachers in the study all expressed general beliefs describing how children learn or how learning was best promoted. The teachers were eclectic in their beliefs and did not consider that there was only one way for pupils to learn. For example, they believed that children learned through repetition, problem solving and active involvement in the learning process. They also believed that learning should be meaningful, should involve pupils with concrete experiences and involve the pupils being exposed to a variety of stimuli (different modes of presentation).

Seven of the nine teachers considered repetition important. For example, teacher 1-3 stressed in both her lessons the belief that

children learn through repetition of a response. The belief that
repetition was instrumental in learning was mentioned five times in
this teacher's social studies lesson when new concepts were being
presented to the pupils, "it's just a final reinforcement of the baby
animal at the end of each session just to make sure they got it."
Later in the lesson this teacher commented, "it's repetition in Grade
One."

Teacher 1-3 indicated, as did the other teachers, that she was
eclectic in her beliefs about how children learn. She also believed
that problem solving or learning through discovery was important for
Grade One pupils. For example, this teacher stated, "You tell them
but it doesn't mean as much as by the fact that they've had to solve
this problem by themselves."

The belief that pupils should be actively involved in the
learning process was expressed by teachers at the three grade levels.
For example, in Grade One, teacher 1-1 stated, "They learn when they
participate and do it themselves," and, "Rather than having them sit
there and be taught at, they do it themselves and learn by doing."
In Grade Six, teacher 6-1 expressed this belief when she explained,
"they learn to write better and they are active, they're being active
in whatever it is . . . well they learn a lot more."

Teacher 3-2's comments were typical of those who believed that
learning should be meaningful. This teacher stated, "and I thought if
I can get them to relate back to their own personal experiences it
will become more relevant, more meaningful," and, "Here again, I like
to relate to what they know, what they feel, personal experience."

Five of the nine teachers believed that pupils learned through

a variety of modes and should be exposed to a variety of stimuli.
For example, teacher 1-1 explained, "visual plus audio . . . using
both anyway rather than just saying them."

Three of the nine teachers mentioned a belief in exposure to
concrete experiences as being important in learning. Teacher 6-3
illustrated this belief in her social studies lesson and stated,
"There's always more concrete examples you can give, the better they'll
do."

Beliefs Concerning Specific Learning Principles

Teachers expressed beliefs about specific learning principles,
as well as about general learning processes. Self-concept maintenance-
enhancement, reinforcement, motivation and transfer of learning were
all mentioned by at least five teachers.

Belief in the principle of self-concept maintenance-enhancement
was expressed seven times by teacher 6-2 in her social studies lesson
which involved group competitions. At the commencement of the lesson
when returning corrected work to the pupils, teacher 6-2 did not return
it in order of merit because, "I think that's too embarrassing for the
people who are at the bottom, it's just not fair." During the course
of the group competition she gave a pupil an easy question because he
had earlier answered questions incorrectly, ". . . and it makes him
feel good if he does get that one right."

A belief in the value of reinforcement was generally revealed
when teachers rewarded cognitive performance, or a combination of
cognitive and affective behavior. For example, after a pupil who had
been initially disruptive in her language arts lesson had worked
quietly and completed an assigned task, teacher 1-3 permitted him to

play and commented, " . . . so I felt O.K. to reward this type of
behavior, that he would be able to do something that he would like to
do, just something for doing it, doing it for doing its sake."

Teachers used motivation with both individuals and the whole
class and expressed their belief in this principle at different stages
of the lesson. Teacher 3-1 showed an awareness of and belief in the
use of motivation when she read out part of a student's composition
to the class and stated, "Just a motivational thing, look here's a
kid that's really going gung ho."

The five teachers who indicated an awareness of and belief in
the principle of transfer had pupils practise a task or similar tasks
in different contexts. For example, teacher 6-2 completed a game
exercise with her pupils and then set them some written work to
complete. She commented, ". . . and maybe bring some of the things
that they picked up from their game into the written exercise."

Beliefs Concerning Memory

Six of the nine teachers expressed at least one belief
concerning memory. The most common belief expressed (by four of the
six teachers) was that by using associated cues the pupils would be
able to remember concepts and factual knowledge. For example, teacher
1-1 during her social studies lesson asked her pupils, "What's some-
thing else with tri in it, something that has three wheels and you
ride on? And we looked at tricycle and triangle and again at the three
horns on the Triceratops and that was it . . . it's also to help them
remember the names."

Beliefs Concerning General Psychological Principles

This sub-category contains general beliefs the teacher holds concerning pupils' social development, personality development and individual differences. The few beliefs recorded in this sub-category do not permit the use of illustrations that have any generality across teachers.

Objectives

Table 6 indicates that references to objectives formed between 1.9% and 7.6% of teacher thoughts in this study. Objectives refer to short-range and long-range pupil outcomes the teacher hopes will be achieved. When the objectives were analysed it was found that they could be sub-categorized into three discrete types: general, lesson specific and lesson facilitating. The percentage distribution of these sub-categories is contained in Table 13.

General Objectives

These objectives refer to broad objectives that a teacher considers should be stressed in all lessons, or all lessons of a similar type. At times these objectives apply to individual pupils and at other times they apply to the class as a whole. Some examples will illustrate the types of general objectives referred to by the teachers in this study.

T 1-1: . . . a very general idea that they should be as self-sufficient and independent thinkers as can be trained.

T 3-1: . . . because I want them to be as verbal as they can be.

T 3-2: . . . so I like to encourage them to think diverse thoughts, and accept them as being possibilities, not just toss them aside.

Table 13

Sub-Categorization of Objectives Category

Sub-Categories of Objectives	1-1 L/A %	1-1 S/S %	1-2 L/A %	1-2 S/S %	1-3 L/A %	1-3 S/S %	3-1 L/A %	3-1 S/S %	3-2 L/A %	3-2 S/S %	3-3 L/A %	3-3 S/S %	6-1 L/A %	6-1 S/S %	6-2 L/A %	6-2 S/S %	6-3 L/AD %	6-3 L/AP %	6-3 S/S %
N10	26		12	15	18	28	25	24	26	17	5	5	6	16	7	7	15	8	19
General		26.9		26.7	11.1	7.1	28.0	29.2	7.7	29.4	20.0				14.3	28.6		50.0	21.1
Lesson Specific	100.0	73.1	100.0	46.7	83.3	82.1	64.0	66.7	92.3	70.6	80.0	80.0	100.0	62.5	85.7	71.4	100.0	37.5	73.7
Lesson Facilitating				26.7	5.6	10.7	8.0	4.2				20.0		37.5				12.5	5.3
	100.0	100.0	100.0	100.1	100.0	99.9	100.0	100.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1

T 6-3: . . . and to try to get them to draw their own
conclusions.

Lesson Specific Objectives

These objectives are the preactive objectives cited by the
teacher in the pre-lesson interview. They are the objectives that
describe what the teacher hoped the pupils would achieve during the
lesson. Some illustrative examples of this type of objective are
listed below.

T 1-1: . . . but I wanted them to see the connection between
the "sh" sound and the S-H that they all had S-H's on
them.

T 1-3: I wanted them to know what a cartwheel was.

T 3-1: . . . to really feel the setting, the person, this
kind of thing.

T 6-1: . . . but I wanted them to also put the name on the
map, that colour.

Lesson Facilitating Objectives

These objectives occur spontaneously throughout the lesson and
serve the purpose of facilitating the achievement of the pre-stated
objectives for the lesson. Often they refer to behavior the teacher
desires from the class. Some examples are listed below.

T 1-2: . . . and I wanted X to join in.

T 3-1: . . . and I just didn't want him to get out of hand.

T 6-1: Well, I just wanted him to go and sit in another seat.

T 6-3: Just to be quick about it.

Lesson Content

Table 6 indicates that for the nine teachers, thought units

concerning lesson content ranged between 1.4% and 9.7% of a teacher's thoughts for any one lesson. The table also suggests that thoughts about lesson content were not subject specific in the case of the language arts and social studies lessons videotaped. For five teachers there was a slightly higher percentage of lesson content thoughts in their language arts lesson than in their social studies lesson.

Analysis of the lesson content thoughts of all teachers indicated that there were no major categories of thoughts about lesson content. Most thought units about lesson content were concerned with the concepts or factual knowledge being presented to the pupils. This can be illustrated from teacher 3-2's social studies lesson.

> T: I wanted the idea that the important exporting countries, that things don't always flow one way or another.

Later in the lesson she commented:

> T: At this point here I wanted to focus in on the idea of Japan being today an industrial nation, rather than an agricultural nation.

Information--Pupil

This thought unit is concerned with the information a teacher carries around in her head that centres on pupil characteristics such as personality, academic potential and performance, general classroom behavior, social behavior and home background information. Table 6 indicates that in the lessons videotaped, between 5.5% and 14.2% of the teachers' thoughts were focused on information--pupil. When this category was further analysed it was found that the thoughts clustered into nine sub-categories. This sub-categorization, which appears as Table 14, indicates that teachers carry a wide variety of information around in their heads concerning the class as a whole as well as

Table 14

Sub-Categorization of Information--Pupil Category

Sub-Categories of Information-- Pupil	Teacher																	
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	33	21	39	29	31	26	47	28	54	16	34	27	19	19	33	30	18	8	16
Personality	21.1	9.5	35.9	31.0	16.1	19.2	19.1	10.7	25.9	12.5	11.8	3.7	10.5	10.5	6.1	20.0	5.6	25.0	12.5
Academic Ability	18.2	14.2	2.6	27.6	9.7	11.5	4.3	3.6	5.6	6.3	5.9	3.7	15.8		9.1	3.3	5.6		6.3
Academic Performance	15.2	4.8	10.3	10.3	25.8	19.2	29.8	10.7	14.8	12.5	8.8	11.1	26.3	10.5	18.2	13.3	38.9		43.8
Classroom Behavior	42.4	71.5	46.2	31.0	42.0	30.8	38.3	60.7	48.2	68.8	70.6	74.1	36.9	79.0	48.5	40.0	38.9	62.5	37.6
Social Behavior							2.1				2.9	3.7							
Home Background						11.5		10.7											
Physical Characteristics					6.5				1.9							3.3			
General Information	3.0		5.1			7.7	6.4	3.6	3.7			3.7	10.5		18.2	20.0	11.1	12.5	
	99.9	100.0	100.1	99.9	100.1	99.9	100.0	100.0	100.1	100.1	100.0	100.0	100.0	100.0	100.1	99.9	100.1	100.0	100.2

individual pupils. Information--pupil is closely related to the category of expectations and, as is illustrated earlier in this chapter, expectations are based on the teacher's assumed knowledge of the pupils and the class as a group.

Several general comments need to be made about this category before the sub-categories are discussed. First of all, the thoughts about pupils and the class occurred throughout the lesson. Often interactive thoughts concerning a pupil's characteristics were expanded into a non-interactive description of many of the child's characteristics as perceived by the teacher. These non-interactive descriptions, called "Case Studies" by Marland (1977), are briefly discussed later in this section on information--pupil.

The teachers in this study rarely made reference to the same student in both lessons. On the few occassions when this did occur, the teacher referred to different characteristics of the pupil. For example, teacher 6-2 referred to X in both her lessons. In language arts she stated that "X is a good student," while in social studies she indicated, "X, he's been absent so he didn't get his completed."

It was also found that the teachers infrequently gave information--pupil statements about the same child in any one lesson. When this was done different information was offered about the pupil. Teacher 3-3 illustrated this point in her social studies lesson when she explained, "X will usually listen to this stuff," and later when she stated, ". . . not with X, he's got lots of brains." Teacher 3-2 also illustrated this point in her social studies lesson when she revealed, "This annoyed me, X is always late for class." Later in the lesson she again referred to this same pupil when she stated, "X is one

of my best distracters in class."

However, it should be noted that while information--pupil was usually only offered once concerning a particular pupil throughout a lesson, the teacher indicated through her perceptions or feelings that she was quite often continuously aware of a particular pupil or pupils.

When coding information--pupil for both Table 6 and Table 14, if the same information about a pupil in any particular exchange between the interviewer and teacher was given more than once, it was only coded as one thought or one piece of information. The sub-categories of Table 14 are now discussed, followed by a discussion on how teachers gain information about pupils.

Personality

All teachers made reference to pupil personality character-istics in all the lessons videotaped, with teacher 1-2 indicating that in both her lessons, approximately one third of her information--pupil thoughts related to personality.

A wide variety of "broad" descriptive terms were used when the teacher referred to pupil personality. These references to pupil personality were often revealed during dyadic interactions between teacher and pupil. For example, when listening to a pupil's comments during an individual reading session, teacher 1-1's thoughts revealed:

> T: He is a funny kid . . . . He's got a real sense of humour,
>   really well developed for his age.

When listening to another child read and stumble over a word, teacher 1-1 reported, "She gets self-conscious."

Teacher 1-2, also during an individual reading session, reacted to a child reading a page from bottom to top by stating, "This is this

little X, who has a very keen sense of humour." Later in the lesson
when the teacher noticed a pupil becoming involved in a self-directed
activity she was pleased because the child had previously held back
from becoming involved because the teacher saw her as, ". . . very
sensitive, a perfectionist, very conscientious in every way."

Not only did teachers reveal their impressions of pupils'
personality characteristics in dyadic interaction situations, but they
did so on many occasions when small group or whole class activities
were occurring. For example, teacher 3-1 in a group discussion
selected a non-volunteer to answer, ". . . because she's a very quiet
student," and while discussing a pupil's response in a group discussion
session teacher 3-3 indicated, ". . . he's a very shy type of kid. You
have to be really careful what you say because you can make him cry
real easy you know, if you contradict what he's saying."

Academic Ability

This sub-category refers to the teacher's perception of the
pupils' academic potential as opposed to the pupil's actual classroom
performance. All teachers reported thoughts in this category, but
not in every lesson. Thoughts about academic ability were reported in
general terms and teachers did not use specific psychological concepts.

Some examples of this sub-category, without contextual
elaboration, are listed below.

> T 1-1: Well because he has a good visual memory for words,
>   even long words if he sees them.
>
> T 3-2: He's a fairly bright little boy.
>
> T 6-1: . . . but he's just, he's just a smart kid.
>
> T 6-3: . . . because she's a low student.

Occasionally a teacher referred to the general ability level of the class as a whole, especially if it was a streamed group. Teacher 6-1 indicated her thoughts after correcting some homework when she stated, "They are supposed to be an upper average class and that's not too bad for that class, it's a large class."

Academic Performance

This sub-category refers to a pupil's or the group's general performance on work tasks. All teachers reported thoughts in this category, but again, not in every lesson. Teacher thoughts in this area indicate that all teachers processed a wide variety of information concerning the academic performances of individuals in their classes. To illustrate this point, some examples are listed below:

T 1-1: . . . and she's good in that she knows the words and does practise.

T 3-2: X has troubles with oral and written work. He gets an idea and he can't develop it, and this came out in the lesson here.

T 6-2: Her map is always neat.

T 6-3: It's not her strong point, oral reading.

The teachers in this study also referred to the academic performances of their classes in general. For example, teacher 1-2 when working with a reading group stated, "Their weakest area right at present is still with recall," while teacher 3-1 when repeating instructions to her whole class revealed her thoughts as, "But they find it so hard to follow instructions."

Classroom Behavior

Table 14 indicates that this sub-category of thoughts about

information--pupil was the one most frequently referred to by all teachers. This sub-category contains both individual and group references and deals with activities and verbalizations of the pupil or group that the teacher considers typical behavior. Teacher thoughts in this sub-category can be illustrated by the following examples.

Teacher 1-1 when reminding some pupils to concentrate on their work commented, "Because there's a couple of them I know are always turning around," and later in the same lesson when a little girl cuddled her she stated, "She and another little girl especially do that all the time."

Teacher 3-2 when helping a student commented, "She doesn't always listen to instructions."

The majority of the thoughts in this sub-category referred to group performance. To illustrate the variety of thoughts in this area, examples are listed with minimal contextual elaboration.

T 1-2: They like to draw.

T 3-1: If they are interested they ask a lot of questions.

T 6-2: It takes them a while to settle down so I don't go up to the front immediately.

T 6-3: They don't like to memorize things as a rule.

Social Behavior

This sub-category is a variation of the sub-category classroom behavior and refers specifically to a pupil's interaction with his or her peers. There were only three references made to this sub-unit. For example, teacher 3-2 referred to a pupil being chosen to lead a group activity and stated, "She never gets picked for these things," while teacher 3-2, watching two pupils voting on the choice of a story

commented, "And then X and Y are supposed to be best friends, they are best friends but Y is always trying to run X."

Home Background

There were only five references made in this category and all were made by teachers 1-3 and 3-1.

Teacher 1-3 illustrated her knowledge of some of her pupils' home backgrounds when she stated, "Now some of them have had chickens around their farms," and "A couple of them in there have had experiences with Shetland ponies."

Teacher 3-1 when indicating her knowledge of one pupil's background commented, ". . . and the thought that flashed through my mind there was X's are extremely wealthy. They have a swimming pool in their house and they have a Winnebago."

Physical Characteristics

There were few thoughts reported that centred on a pupil's physical appearance or motor co-ordination. Teacher 1-3 while listening to a pupil read revealed she was thinking, "This little guy has some slight speech problem." Later in the lesson, this teacher, while listening to a pupil discussing a story stated her concern about him as follows, ". . . because he sounds hoarse, continually hoarse as if he's got a really bad cold."

Another example in this sub-category is provided by teacher 6-2 who when observing a student's work stated, "Her motor skills of control is not all that great yet."

General Information

Information in this category was reported by all teachers and

generally refers to background information about the pupil that is not specifically related to the home situation. Some examples, without detailed contextual elaboration will illustrate teacher thoughts in this area.

> T 6-1: He's a very new boy here, he hasn't even been here a
> month.

> T 6-2: X I couldn't keep because he has a bus to get.

Case Studies

At times during the stimulated recall interview the teacher presented some interactive information about a pupil and then went on to describe additional characteristics of the pupil. Because the teacher was not consciously processing this information at the time of her teaching, this data was classified as non-interactive and therefore not coded. However, because these case studies reveal the variety of detailed information a teacher carries around in her head concerning pupils, several examples are given as illustrations of the perceptions and "facts" about pupils that teachers are aware of. These case studies, which were given by all teachers, suggest that the interactive data is only a small sample of the large amount of information--pupil that teachers carry around in their heads.

Teacher 3-1 gave this information about a pupil:

> T: There I was thinking what a nice little boy X is. Teachers
> are not supposed to have favourites, but I'm afraid X's kind
> of won my heart. He's a diabetic and he's just a real
> sweetheart and I was just kind of thinking, what a nice kid
> . . . . He phones me on weekends, I wish he didn't like me
> quite so much.

Teacher 3-2 in her language arts lesson when expressing her reaction to a child's comment elaborated in the following manner:

> T: I was surprised. I know children have feelings of aggression,

but this wasn't really aggression I don't think on her part. Defence perhaps, maybe she feels a little insecure, this is what I thought, and she does. She comes across that way quite often, that she feels insecure. She has a problem relating to other children in that the kids in her part of the neighbourhood either are a year to two years younger or the next oldest, that would be two to three years older. So she's betwixt and between in her social world after school and she had no one to relate to in her peer group. At school this comes across because she's often awkward, she's often shy, she'll start to say something and if she feels it's too personal she'll cover it up in a mannerism. She's a neat little kid though.

Sources of Knowledge About Pupils

The transcripts revealed some of the ways in which teachers gained information about their pupils. Sometimes a specific strategy was adopted and at other times the teacher indicated it was the continuous and prolonged contact with a class that provided the information.

Teacher 3-1, when asked how she knew about the pupils' home backgrounds and their lack of affection replied with the following non-interactive data.

> T: Usually it comes out through the guidance counsellor, parent-teacher interviews. I watch them when they eat their lunch. I supervise the lunch room, you can pretty well tell for instance, the one little girl right there that's very close to me, she gets a dollar every day to go down to buy candy and pop for lunch. She very rarely has a very substantial lunch. And oh the ones, you can tell the ones that really care. They have, lunches tell me a lot. I don't know if that's a fair way to judge and the way they dress and whether the parents are interested in what they're doing at school and things like that. And it comes through by at least half way through the year anyway.

Teacher 1-3 indicated on several occasions that the continued contact with the pupils had given her the opportunity to gain consid-erable information of all types about her pupils. In her language arts

lesson she stated, "I've got to know these kids as if they were my own," and then in her social studies lesson she stated, "And again that's a thing you learn through the year, your class." Later in the lesson when anticipating a potential behavior problem, teacher 1-3 pointed out, "And this is something that I have learnt with them, working with them through the year." Having a class size of 17 was possibly a facilitating factor in assisting this teacher to gain information about her pupils.

Teacher 3-2 indicated that she found out information about pupils by talking to other teachers but often it was a trial and error process.

> T: One way is like X. I did an awful lot of talking to his last year's teacher because of his repeating Grade 3. But a lot of it is just trial and error at the first of the year and you get to know people in a social situation. You have to feel your way . . . and you find out what is acceptable and what is not . . . . It's trial and error I think basically, because there's no way you can sit down with a book and say O.K. I'm going to learn about child personalities in my class from this book. You go back on what you've learnt in previous years, you go back on what you've read and try to fit these things together with the individuals that you have.

Information--Other

Fewer thoughts were recalled in this category than any of the other eleven. The percentage distribution of thoughts in this category ranged from a low of 0.0% for teacher 6-3's language arts lessons to a high of 3.1% for teacher 6-2's social studies lesson.

The thoughts reported in this category were of two basic types and comprised either classroom rules or thoughts irrelevant to the lesson. Rules reported generally referred to organizational features

of classroom life. For example, when teacher 1-1 was reporting her thoughts about a pupil interruption, she stated, "They know they are not supposed to come up and interrupt a conference unless it's an emergency."

During her social studies lesson teacher 3-2 indicated her thoughts were about a rule when an intercom message interrupted her lesson, "We have a school rule, that whenever something comes on we are supposed to have dead silence."

Teachers reported few thoughts that were irrelevant to the lesson. When irrelevant thoughts were reported, the teacher indicated that she had been conscious of the thoughts when there was no active interaction between herself and the pupils. When walking around the room supervising, teacher 6-2 reported, "Gee it looks like rain outside, I'm going to have to take my coat and put my coat on outside." Teacher 3-1 during her social studies lesson on Japan had shown the pupils a small bottle of sake wine. Shortly afterwards, when there was a "lull" in the lesson, this teacher reported, "Actually at that point I was thinking of my husband, he really likes it, and I could never understand why."

Feelings

Feelings are the emotions experienced by the teacher during the lesson. As Table 6 indicates all teachers in the 19 stimulus lessons revealed that between 2.7% and 11.3% of their thoughts related to feelings. Over 30 nouns were used to express a wide range of feelings.

Feelings that could be classified as negative were represented

by concepts such as anger, annoyance, disappointment and frustration. Neutral feelings were indicated by statements such as "wasn't surprised," "don't care" and "not excited." Positive feelings were represented by concepts such as amazement, amusement, pleasure, surprise and enjoyment.

The pattern of feelings expressed varied from teacher to teacher and from lesson to lesson. In some cases there was no pervasive feeling or cluster of similar feelings reported by a teacher during a lesson, and on other occasions, usually when the lesson was not meeting the teacher's expectations, a pervasive feeling or allied cluster of feelings was revealed throughout the various stages of the lesson.

Teacher 1-1 is an example of one who exhibited no pervasive pattern of feelings in either of her lessons. She reported experiencing amazement, annoyance, boredom, dismay, pleasure, surprise, suspicion, bother, uneasiness and dislike in both lessons. However, teacher 3-3 in her social studies lesson reported throughout the lesson that her feelings were of anger, annoyance, disappointment and frustration. Eighteen of the 25 feelings revealed were in these negative categories. These feelings were primarily expressed at the pupils' affective behavior in a lesson the teacher considered "went poorly." It was a lesson immediately before a recess break on a hot afternoon and the teacher was working with a subject which she found fascinating and had expected the pupils to take a strong interest in. The inattention of the pupils and lack of interest in the topic, as well as the teacher's lack of success in motivating the pupils caused her to express feelings of anger, annoyance and frustration. Some

quotations from teacher 3-3's social studies lesson illustrate this
point.

> T: That situation I remember I started to get quite angry
> there. Because all of a sudden you get the kid asking
> this and this kid asking that and someone else jumping up
> and drawing your attention to them and that kind of
> question.

At a further stage in the lesson the teacher reported:

> T: Well, frustrated I mean we talked about this and I thought,
> I am sure they got something out if that day and to be
> sitting there just non-responding and I thought well if I
> say "Yes? No?" then that will prompt them to say some-
> thing. They still didn't really. I thought oh well, I'll
> just continue on.

And finally teacher 3-3 reported on her reaction to a boy who
interrupted her giving information to the class:

> T: Well by this time you have to understand that I'm so
> totally frustrated then and angry at this whole situation
> that it would be just one more thing adding to it.

There were of course many times when positive feelings were
pervasive in a lesson. The social studies lesson of teacher 1-2
reveals this point. Twenty-one of the 27 feelings revealed in this
lesson were positive and centred around pleasure, surprise and
enjoyment. Some quotations from this social studies lesson illustrate
this point. When a pupil remembered a concept from a previous lesson
the teacher indicated, "I was pleased that he remembered." At a later
stage in the lesson the teacher reported, "I was pleased that they
recalled as much as they did and that they could answer 'why' questions
fairly well. At that point I was pleased with what was happening."

At still another stage in the lesson the teacher reported,
"I was really happy. Really pleased that this was all coming out. I
felt like saying, 'Say more, say more'." Towards the conclusion of the

lesson when the pupils were involved in a problem solving session, the teacher revealed, "It shows that something is happening, in, their, they're thinking about something, trying to reason out something. I like that kind of thing to happen."

Two concluding points need to be made about teacher emotions. First of all, teachers rarely revealed strong negative feelings such as anger and annoyance at a child's poor academic performance. Occasionally annoyance was expressed, but more often concern, disappointment and surprise were the terms chosen. However, teachers did indicate that they were angry or strongly annoyed or frustrated because of pupil behavior problems. This is illustrated in the negative feelings of teacher 3-3 described on the previous page.

The second and concluding point to be made to this section is that all nine teachers in this study believed that their feelings should not on all occasions be hidden from the pupils. Obviously, indicating one's emotions could serve a variety of purposes. Several examples can illustrate this point. Teacher 6-2 believed that showing her emotions would act as a motivational factor.

> T: . . . but being that they could see I was genuinely pleased, then they're going to go back over and instead of wasting time or sitting around talking, they're going to try and think up another one.

Teacher 1-2 used a show of emotion as a reinforcement for a pupil's work during the morning's session.

> I: What were you thinking as you were giving that little girl a cuddle then at the end of the lesson?

> T: Oh quite motherly I think. She's very affectionate and needs that . . . she's spent all this energy doing all these sheets and stuff and just needed a little bit of attention.

SECTION C

Macro-Analysis of Teachers' Interactive Thoughts

Analysis of the stimulated recall transcripts was carried out on two levels. A micro-analysis based on the thought unit, as described in Chapter IV and outlined earlier in this chapter, was employed to code and then describe the discrete types of thoughts each teacher had during the interactive phase of teaching. Because thought units varied in their syntactical length from several sentences to a clause or phrase, it was found that this micro-analysis at times fragmented and obscured many variables that influenced teachers' behavior during instruction. Therefore, the second level of analysis in this study consists of a macro-analysis of the inter-active data.

The purpose of the macro-analysis was to supplement the micro-analysis and was carried out to investigate teacher held beliefs, principles, rules and other factors that influenced teacher behavior. The data obtained in the macro-analysis were used in conjunction with the micro-data to answer research questions one to four.

The macro-analysis was carried out by reading each transcript, segment by segment and recording each reference made to a particular variable. Reference to variables varied from a sentence to a paragraph in length.

Variables Influencing Teacher Behavior

Macro-analysis of the transcripts revealed variables that were grouped into three major clusters. Under ecological variables were

grouped nine variables that influenced teachers' interactive behaviors. The second major group of variables deal with teaching style variables and overarching principles, while the third group of variables have been termed general pedagogical variables.

Ecological Factors

Ecological factors refer to the conditions and characteristics of the environment to which the teacher must adjust. As Kounin (1970) has pointed out:

> The classroom had its own ecology. It had geographical location, physical setting, props, activities, time allotments, personnel, events, expectations and purposes that make it different in many respects from other settings. (p. 59)

Nine ecological variables were identified in the data: temporal, spatial, class props, group size, grade level, class ability, organizational, administrative-managerial, climatic. Each of the variables is in turn defined and examples of its use are given and discussed.

Temporal

This sub-variable refers to any aspect of time, such as the concluding stage of the school year, a particular segment of the school day or the time demands of a particular lesson that influences a teacher's behavior.

Table 15 indicates that all teachers, with the possible exception of teacher 3-3, considered time and were influenced by its various manifested intrusions into their environment. The various aspects of time all had an influence upon a teacher's instructional activities.

Table 15

Ecological Factors Influencing Teacher Interactive Behavior

Factors	Teacher																			Total
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3			
	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/AD	L/AP	S/S	
Temporal	4	4	4	3	5	2	3	11	10	4	2	1	5	5	13	7	1	6	1	91
Spatial			1				1	1	1							2	1			6
Class Props	9	1	3	2	1	1	3	4	1	1	2	1		9	2	1	4	3	2	50
Grade Level	1	3	1	2			7	3	2	1	2				3	1	1			27
Class Ability	1		1						1		1		1		1		3			9
Group Size	1		1						1				3							6
Organizational	6		4		3										7		5			20
Administrative/ Managerial	2	2						1			1	2			1	2				16
Climatic				1						1										4

The data for the sixth grade teachers were gathered towards the end of the school year and this time of the year influenced the interactive behavior of two of the three sixth grade teachers. For example, when teacher 6-3 found that some pupils did not have the correct materials she debated whether to chastise the children, and in deciding not to, explained:

> T: At this time of year, it was, that's another thing you see, is there much point to it now? Because if they haven't learnt the good habits now, at this last moment, a last ditch effort, and I'd been too hard on them at this time of the year.

Teacher 6-2 punished a child by giving him lines to write out and then stated:

> T: It's no use trying to harangue him any more about it . . . so my attitude is at this time of the year if I haven't gotten it through to them in nine months and one week, it's not going to get through to them in the last three, so I'm just preserving myself.

All teachers were conscious of the different periods of the school day, and tailored their instructional strategies to take account of the time periods. For example, teachers were cognizant of pupil reactions immediately prior to recess times.

Teacher 1-1 explained that she normally had children sound out words and try and work out the spelling themselves and did not normally write words on the chalkboard without discussion, but, "because it would be too hard to think and write and spell and every-thing all at once, especially at that time of day, it's afternoon, it's just before recess and I knew that was coming up, and just to make it easier for them."

Teacher 1-2 reported:

> T: At this point I was becoming conscious that it was getting closer to the end of the day and that we had to finish

and yet there were a couple of things I wanted to do yet.

Teacher 3-1 also illustrated the influence of the segmented school day upon her teaching:

> T: At that point I was just, on the fence trying to decide whether I should stop and explain to them that Japan is a class society . . . and then I thought, no.

> I: What was your reason for not getting into it then?

> T: Time again. I knew it was getting near bell time so I just thought, this is just trying to get them interested in Japan. Details could come later.

Lesson planning appeared to place time constraints upon some of the teachers. The data suggest that when some teachers plan a sequence of activities for a lesson then they seem determined to follow the sequence through without deviation, and in doing so feel pressured by time constraints. This can be illustrated from the language arts lesson of teacher 3-2.

> T: Oh that's one thing that bothers me. I think I said one more person at this point. There's never enough time in school to let all the kids in a class this size express themselves. Oral expression I feel is very important and yet when you want them gung ho, you want them excited and keen and you want them all to be able to share, but darn it, you always watch that darn clock.

This teacher also pointed out:

> T: I felt very badly because some of these kids are very keen right at this point, and yet I've only got so much time in which to develop this and I have to go on.

Later in the same lesson teacher 3-2 pointed out:

> T: . . . and I also knew that I had to get into the second part of the lesson where it was written rather than the oral response and I was getting pushed for time again too.

Again later in the same lesson teacher 3-2 stated:

> T: While I was quiet, it occurred to me this time factor again. And so I knew I had to gloss over the next two. I think I glanced at my watch too if I'm not mistaken.

But again I got that feeling of time pressure and I had to get them going. I feel that pressure a great deal in teaching, maybe next year I won't when I'm with my own class most of the time."

At a later stage in the lesson when some pupils wanted to read out their creative writing the teacher did not let them. Her thoughts at the time revealed, "they wanted to share with each other right then and there what they had done and that distressed me because I knew we were again short of time and I wanted to start pulling them back in a bit."

Still later, toward the conclusion of the lesson, teacher 3-2 stated:

> T: Again the time element was getting to me and I remember I was feeling pressured. We were over by a few minutes by this time and I wanted to get into the next part . . . . Reading I think it was, and pressure feelings were coming back in, "Get them going, get them going."

This concern with completing all aspects of a planned lesson was not only evidenced by teacher 3-2, teacher 3-1 in a social studies lesson, teacher 6-2 in both her lessons, teacher 6-3 in a language arts lesson and to a lesser extent all other teachers, with the exception of teacher 3-3, consciously monitored time and adapted their teaching strategies or changed their instructional plans under the influence of time in order to complete a lesson. A reference by teacher 6-2 in her language arts lesson summarizes this concern for completing a lesson as planned, "So I just helped him out, I didn't let him, I didn't give him time to sound it out, I should have I suppose, but we've got to continue."

Some specific teaching strategies, prompted by the consciousness of time, are worthy of note.

Several teachers used a "stand-by" (that is, a pupil who could

be relied upon to give a correct answer) when the teacher wished to increase the pace of the lesson. Teacher 6-2 in her language arts lesson, when describing her thoughts concerning the choice of a pupil to write an answer on the chalkboard explained:

> T: Well, to be honest, we were running short of time, X's a quick writer, so I knew that he would get it up there very quickly so that we could be on to something else.

Teacher 6-3 toward the conclusion of her social studies lesson also illustrated the use of the "stand-by" in relation to time constraints:

> I: Any reasons, you were asking X then?

> T: I knew I'd get it . . . . I didn't want to give them too much. [Is referring to spending time on a discussion aspect of the lesson]

Teacher 3-1 in her social studies lesson illustrated on a number of occasions how awareness of time caused her to use a "stand-by" to speed the lesson along. For example:

> I: Can I ask you why you asked X to answer then?

> T: I was quite sure he had the right answer there, that's why I asked him . . . I think I had glanced at my watch before then and I was a bit concerned whether I would get the questions covered before the bell rang.

Two points should be noted about teacher use of "stand-bys." First of all, the "stand-by" did not always oblige with the desired response. Secondly, "stand-bys" were not always called upon because of temporal influences. At times the teacher attempted to involve a "stand-by" in the lesson to give depth, richness or a new direction to the lesson. Teacher 3-1 illustrated both the above points when she asked a pupil in her language arts lesson to contribute to a creative story being developed orally by the class:

> T: There's where I was mentally saying, "I'll strangle him

when I get a hold of him," because he is an excellent
writer. He was one of the leaders I counted on. I don't
think he was even aware of what was going on at that point
when I asked him if he wanted to carry on. He just went
like this [shrugged shoulders] "No," and I was really kind
of disgusted with him right there. At that point I could
see that the ideas weren't developing very well.

The temporal variable influenced teacher instructional
behaviors in a variety of other ways. Teacher 3-1 when explaining why
she gave out some material instead of the pupils, explained, ". . .
and here's the time thing again and I can do it ten times faster."

Teacher 6-1 when thinking about the organization of a unit of
work decided on a teacher directed and controlled approach because of
the time factor. This teacher pointed out that:

> T: I sometimes think well it is better to get them researching
> on their own . . . they learn a lot more. However,
> you know, if I had them researching on their own and gave
> them two weeks to do a report on one area they would miss
> out on the other area. There just isn't time in many
> cases.

Teacher 6-2 because of one aspect of her teaching philosophy
was conscious of time when organizing her language arts lesson:

> T: Clock, looking at the clock. Thinking that I wanted to
> have these put on the board and I also wanted to assign
> one page for them to work on . . . to give them at least
> ten minutes time to work on it because I don't believe in
> homework . . . . So, always conscious of time.

Concerns about time and completing work for homework were also
shown by teacher 6-3 in a language arts lesson, "I wish I have more
time, I wish they could do the assignment in class, since I can't,
they'll have to do it."

In summary, several concluding comments should be stressed
about the influence of the temporal variable upon a teacher's
behavior. The fact that time was considered 91 times throughout the

19 lessons attests to its importance in influencing the teachers' interactive behaviors. However, no consistent patterns of influence emerged in the data. The influence of time varied from teacher to teacher and from lesson to lesson. It appears that several reasons account for this variation in influence. Lesson planning and the particular lesson objectives to be covered appear to "lock" some teachers into an instructional situation which they seem determined to complete. Whether this inflexibility is determined by personality variables, teacher's role conceptions or other variables cannot be determined in this study, but is an area in need of investigation.

The time of the school day, as well as the planning and structure of the lesson, taken together, appear to account for variations in the influence of time upon the individual teacher's behavior. Teacher 1-3 in her language arts session set the pupils a number of tasks to be completed in a set period of time and was more concerned about time in this session than in her social studies session where discussion was followed by seatwork that the pupils could complete throughout the rest of the day. The variations in references to time by teachers 3-1, 3-2, 6-2 and 6-3 can be accounted for by reference to the structure and objectives of the lessons as well as the time of day at which the lesson was taught. Teacher 3-1's language arts lesson was creative writing in which oral discussion was followed by the writing of a composition. The pupils were given a suggested amount of time to complete the compositions, however, they were encouraged to hand the compositions in only when they were "satisfied" with them. Teacher 3-2 who showed such a concern for time during her language arts lesson did not show the same concern during

her social studies lesson.

Two reasons can be hypothesized for this variation in concern for time. First of all, the social studies lesson was a discussion lesson centred around a small number of concepts, and secondly, it occurred during the last period of the day, thus relieving the pressure the teacher previously alluded to that she was under to complete one lesson and move on to the next. For teacher 3-2 the pressure to move from one lesson to another was possibly accentuated because she did not teach all subjects to her class. Mathematics, physical education and health were taught by other teachers. This teacher revealed her thoughts about teacher specialization when she stated:

> T: There are times when I can say to heck with time, but so seldom, this is because of class changes . . . . I'll cut a lesson short because it's gone, it's time to begin the next subject that should follow.

The social studies lessons of teachers 6-2 and 6-3 both contained review tests followed by discussion sessions and were taught at the end of the school day, this again suggests that the objectives, organization of the lesson and the period of the school day when a lesson was taught could influence a teacher's concern with the temporal variable.

Teacher 3-3 only referred to the influence of time on three occasions in the two lessons she taught. On two of those occasions she considered the pupils' behavior was caused by the time of day in conjunction with the prevailing climatic conditions (warm weather), "You have the kids, they're hot and they're tired and they can't get interested, it's been a long day." (This lesson was taught immediately prior to the afternoon recess).

The apparent lack of concern about temporal influences by

teacher 3-3 can possibly be explained by two factors. Her third grade was the "bottom" of three streamed third grades in the school and the teacher had created a "pupil-centred" room where activities undertaken were primarily related to the interests of the pupils, were chosen by the pupils themselves and, where possible, written work was kept to a minimum. For example, in the language arts lesson dealing with language enrichment the pupils selected the stories to be read and discussed, "So I'm always interested to see which ones they choose first. So just letting them look through, seeing which ones jump out at them to read."

Not only did the pupils determine the content of much of their work, but the length of the lesson was determined by their continuing interest. This flexible use of time was aided by a second important variable. That is, the classroom was completely self-contained with the teacher taking her pupils for all lessons.

Spatial

This ecological sub-variable refers to the teacher's normal working space where interaction takes place between herself and the pupils.

Table 15 indicates that this variable was only considered by four teachers on a total of six occasions. However, despite the limited mention of the spatial factor, the emphasis given by the teachers in their reference to it suggests that it had a pervasive influence upon their classroom interactions.

Teacher 3-2 who taught in a semi-open space area indicated the influence of the spatial variable when revealing her thoughts in the language arts lesson:

T: But I wanted to keep them toned down . . . just very conscious of having a reasonably quiet room because we are in an open area and I often stop in the middle of a lesson and just tone myself down because I feel I can be heard in the I.M.C. which might be disturbing people. So in a case like this where I know they are going to be enthusiastic, I really enjoy the enthusiasm and I want it, but I try and keep a level on it.

Teacher 3-2's classroom opened onto an open space area and early in her language arts lesson which involved role playing, she reported:

T: At this point I wanted to close the door because we often disturb Mrs. B. across the area with my noise and I knew the door was still open so I went over there to close it. It was a distraction to the class but it had to be done.

Unlike teacher 3-2 who showed a concern about disturbing other teachers and pupils, teacher 6-2 in her social studies lesson revealed how being in an open area influenced her teaching. When explaining her ad libbing technique ("Well this is an easy one") between questions in a group competition, teacher 6-2 stated that this technique was, "Just to prime them up ready for the questions," and was partly developed because:

T: I think that comes from working in an open area, too. When you stop talking there's another teacher's voice in the next open area. That voice is going to be the one they are going to start to attend to and then there's a couple of seconds' lapse when you're trying to get their attention back again.

I: How would you know that does actually happen, that they listen to another teacher?

T: Well just from experience in working in an open area. I mean I wasn't conscious of the noise level, but I was conscious that X was having a largely talking lesson over there to do his work. And as I said I think this just becomes a feeling thing after you've been in an open area very long. That if you're going to be talking up there you've got to be talking in such a manner that what you're talking to the students about is more interesting than what's going on over in the next area which they can hear just as well.

These few incidents referring to the influence of open area architecture upon teachers' behavior suggest that teacher style in some instances is modified to accommodate the spatial effects of a teacher's environment. Considering the emphasis still given to open space classrooms, their spatial effects upon teacher instructional style is an area that strongly suggests itself for future research.

Class Props

This variable refers to relatively permanent displays, equipment in the classroom or major teaching aids that are introduced for a specific purpose and become a focal point in the lesson. Props can refer to wall displays, the chalkboard and audiovisual equipment such as tape recorders, record players and overhead projectors. Dunkin and Biddle (1974) when discussing classroom props pointed out:

> Teachers may bring displays of wildlife or ship models to the classroom or set up conventions for conduct, entertainment or competition that are not found in other classrooms. However, once these displays or customs are set, classroom participants, including the teacher herself, are likely to be affected by them. (p. 43)

Table 15 reveals that mention of lesson props occurred on 50 occasions in the thoughts of the teachers in the 19 lessons taught. Teacher thoughts indicated that the presence of props facilitated the flow of the lesson, had a disruptive influence upon the lesson, formed part of a deliberately planned teaching strategy, were used spontaneously because of their presence in the environment and entered the conscious stream of thoughts of the teacher but were not instrumental in promoting any overt behavior.

Teacher 1-1 illustrated the use of props to facilitate the flow of a lesson and assist the achievement of the lesson's objectives.

In her language arts lesson when describing her thoughts concerning a
particular use of the chalkboard she explained:

> T: Visual plus audio, what's the word, using both anyway,
> rather than just saying them. We could have just rhymed
> them all off. But I wanted them to see the connection
> between the "sh" sound and the S-H, that they all had S-H's
> on them.

Teacher 3-1 in her social studies lesson (an introductory
unit) illustrated how a prop that had recently been introduced into
that classroom environment was incorporated into a lesson plan to
assist in the achievement of lesson objectives.

> I: What was going through your mind when you were pointing
> out to that picture in the back and what the girl was
> doing?

> T: I was quite conscious there of what I was thinking. I
> was trying to get them to look at the bulletin board at
> the back because I've put those things up there so that
> they will be interested . . . to go and look at the
> pictures and read there some little captions under some
> of the things.

Teacher 3-1 also illustrated how the same prop can be used
spontaneously in another lesson (language arts) to assist in the flow
of the lesson. When working with vocabulary development the teacher
used the social studies display on the bulletin board in an attempt to
develop a concept.

> T: Actually there was a word, I can't remember it, it slipped
> my mind right now when I showed them that picture at the
> back of the room on Tokyo. Hustle and bustle, that was
> what I thought somebody would come up with.

Teacher thoughts revealed that sometimes classroom props
presented a disturbing element in the classroom that necessitated some
teacher action. Teacher 1-1, who used props extensively in her
language arts lesson illustrated this point on a number of occasions.

> T: The kids are yelling over at the record player again.

I: And so what were your reactions when you heard them making that noise?

T: Well that it was disruptive to the group and to the rest of the class. It was just too loud. It had to be stopped.

Later in the lesson the influence of another prop caused the teacher to delay a reading session:

T: The tape recorder wasn't working. The record button wouldn't go down. Same problem as yesterday so I think, so I had to fix it again . . . . I hate it when anything goes wrong.

Teacher 3-2 also indicated how the use of a prop has to be controlled in order not to cause a disruption in a lesson:

I: Was there any purpose you switched the picture off then?

T: I have a hard time hearing their responses when I'm right by the machine when it's running. And so I shut it off, whenever I feel I have to hear, especially at this point because I knew I wanted to expand this beyond more than just one or two comments, and just for practicality.

On a number of occasions the influence of props was prominent in teachers' thoughts. However, because of lesson organization or objectives, the thoughts about the props did not have a mediating influence upon the teacher's overt behavior. Teacher 1-2 in her language arts lesson illustrated this point:

T: I felt badly with X this morning because I didn't have the things out on the art cart he needed for his project. He was missing two ingredients and he was so keen to do this. . . . And yet for me to get up and go all the way to the other end of the school to get the material he needed, I guess I should have gone but I'm busy with Y and it was sort of a priority thing . . . . But all this putting off because of the lack of material was unfortunate.

Teacher 6-3's thoughts at times also reveal a pronounced emotive orientation toward a class prop:

I: Are you having any particular thoughts as you are writing the sentence up on the chalkboard there?

T: Gees I hate writing on the chalkboard . . . it's one of my considerations to abolish all blackboards. Gee I use them a lot, no, I don't use them a lot, I use them more than I used to, but I still hate it. I take so long to write something on the board. I wish I could write faster

Many thoughts about class props are not as emotively laden as those described above and are rather neutral in nature. For example, teacher 3-2 reported these thoughts during her social studies lesson.

I: Any particular thoughts as you were setting up the overhead?

T: Just getting it straight, I was just trying to get it in the screen right.

Grade Level

This sub-variable refers to general beliefs or perceptions that a teacher holds for a particular grade level. The beliefs or expectations are held for the particular grade level as an entity, and only refer to the behavior of an individual pupil when the pupil's behavior is considered idiosyncratic of the grade's expected behavior. While rarely explicitly stated, it appears that grade level influences have very broad or general developmental bases and do not generally refer to specific developmental characteristics of an age group.

Table 15 indicates that the behavior of all teachers except 1-3 and 6-1 were influenced by the grade level variable. This variable was instrumental in determining the teacher's instructional tactics. This can be illustrated with examples from various grade levels.

Teacher 3-1 when referring to the repetition of instructions explained:

T: When I asked them if they understood the instructions,

again it's this thing with Grade Three, they can't follow instructions either orally or written, and I always ask them, "Do you have any questions now?" So that's why I go over it there just to make sure they know what they're doing.

Another example from teacher 3-1 again illustrates how beliefs and expectations concerning grade level behavior influence a teacher's instructional tactics:

> T: I read X's beginning because I thought it was a good one. It's difficult, I find it difficult in Grade Three, if you give them an example, they all copy the example. And yet you want to give them an example to show them exactly what you're after.

Teacher 6-2 illustrates how, at the sixth grade level, her instructional tactics are influenced by grade level behavior expectations:

> T: I always bring up vocabulary, words that are in common usage all the time. I find that their vocabularies are so small at this grade and how could they be expected to put the words in the proper order if they didn't understand the meaning of one of them. So any time there's a word that I think that some of the class is going to have difficulty understanding I always bring it up in any subject area.

Class Ability

This sub-variable refers to the teacher's perceptions of the academic ability of the class as a total group. Teachers generally based their perceptions upon the fact that the class was the "lowest" of a streamed grade or they made comparisons to classes they had taught in previous years.

Teacher 6-3 exemplified this variable when she commented about pupils reading their parts in a play rehearsal:

> T: Well I didn't really react, I mean, I don't think I reacted either way. I just wasn't too happy about it. I don't want to kill them either.

I: No. By not wanting to kill them, you mean?

T: Criticize them too much . . . . Because these kids here,
     criticism can really kill their enthusiasm, because they
     are low readers.

Teacher 3-3 who taught the "lowest" of three streamed classes,

illustrated this point when she explained:

T: X wanted to read out. X knows that we never do that. I've
     explained to them the reason I don't get them to read out
     is because there's such a very large difference . . . it's
     lots of fun for the kids that read well, but the kids that
     don't read well, it's not a good thing for them, it makes
     them feel bad.

Group Size

This sub-variable refers to the influence the size of the

group has upon a teacher's interactive behavior.

This variable was only mentioned six times and three of those

occasions were by teacher 6-1 who, as Table 5 indicates, had the

largest class of the nine teachers involved in the study. The

relatively small sizes of all other classes, as indicated in Table 5,

could account for the lack of prominence given to this variable.

Teacher 6-1's examples illustrate the influence of this

variable:

T: For those questions I was going down the rows. I quite
     often do that so they each get a turn to say it and with
     a class this big I found that if I say, "O.K. who's got
     the answer to number 21?" And there'd be quite a few
     that'd put up their hands.

Later in the lesson teacher 6-1 explained:

T: I was annoyed at them because they were just taking
     the opportunity to talk and we weren't getting anywhere
     and I really find that I've got to keep them quiet in a
     class this size. I'd love to be more free with everything
     but you just can't.

Organizational

This sub-variable refers to grouping patterns within the class that influence teacher behaviors. These patterns may be relatively permanent or may be short term and relate to a particular lesson.

Teacher 1-1 in her language arts lesson had the pupils at various times working on individual tasks or working in small groups. When preparing to work with a small group teacher 1-1 indicated how her behavior was influenced by group organization:

> T: And at the same time I'm checking mentally to see who's missing from the group and discovered that there was somebody missing, and where she was and whether I should go and get her or whether someone else should go get her.

> I: I can't remember now, did someone go and get her?

> T: I went. I just came back from getting her.

Teacher 6-2 when using groups in a game situation was also influenced by the organizational variable:

> T: In this situation when I made these small riddles for them to try and solve I realized that some of the groups, I didn't bother trying to take the time to group them heterogeneously, so I realized that some of the groups had more of the brighter students in them than others, and as a result they were solving them very very quickly . . . . So I had to think of something else for them to do to fill in their time, and that's why I came up with the idea of them making up their own.

Later in the same lesson teacher 6-2 explained:

> T: This was the group that had so much difficulty doing it . . . . What I'll do is on Thursday I'll change the groupings around and I probably will put more time into the groupings and mix them up so there are some capable students and less capable ones in the groups.

Teacher 6-3 when working with groups in separate rooms indicated how this organizational variable influenced her interactive behavior when she stated, "My thought there was what's going on in the

next room? I'd better find out here before the place is torn apart."

Administrative/Managerial

This sub-variable contains two aspects that affect a teacher's interactive behavior. It first of all refers to general school administrative patterns that intrude into the classroom, such as interruptions by intercom or by a person delivering a message. The second aspect refers to classroom management activities such as dealing with pupils who have lost or broken their material.

As Table 15 indicates, few instances of this variable were recorded in the 19 lessons. Teacher reactions to classroom intrusions were generally positive and looked upon as a relief from the ongoing lesson activity. Teacher 1-1 illustrated this point when another teacher came into her room to deliver a message.

> I: What are your reactions generally when you have
>   interruptions like that, any thoughts?
>
> T: Oh it's a break . . . I always like it when somebody comes
>   in. It doesn't matter what for unless they're going to
>   fire me or something. I like having other people come in
>   for any reason.

Teacher 6-2 reacted in a similar manner when two boys entered her room to make an announcement:

> I: Did you have any thoughts when they came in?
>
> T: It was a little bit of an interruption but I certainly
>   didn't mind, it's sort of something a little out of the
>   ordinary that the kids could get excited about, it's
>   about the Spring Carnival.

Some other teachers reacted negatively to administrative interruptions. This was the case with both teacher 3-2 and 3-3. Teacher 3-2 commented:

> T: That's a nuisance that darned intercom.

I: I was going to say, how do you react when that comes over, do you have any feelings?

T: Well we have a school rule, that whenever something comes on and we are supposed to have dead silence, but there are times that you can't, when you have something going in your classroom you can't just stop it like that [clicks fingers] and I feel very annoyed with it at times.

I: Were you annoyed then?

T: No, I only half listened to it and carried on, I didn't feel it was worth listening to or for the children to be listening to. I'm teaching them bad habits I know. It is a classroom nuisance.

Teacher 3-3 also indicated a similar reaction to administrative interruptions:

I: I was going to say, what thoughts, feelings or reactions do you have to a message like that coming over the intercom?

T: I get tired of, we seem to have a lot of announcements, like a lot of break-in announcements . . . it's just that during the course of the day you get interrupted so many times and I thought gee you know, like if they're really into your lesson, then an announcement like that goes by and you kind of don't notice it. But when you're not really listening it's like one more hassle coming in you know. And then when that came in, it just added one more thing to it. I mean I was fed up really. I thought, "Oh yes, here we go."

This announcement was about "Little League" baseball and some puppies that were to be given away. The class reacted excitedly and a further digression was created in the lesson when a boy, stimulated by the intercom message, announced his aunty's cat had had kittens. The teacher commented:

T: I thought why did he say that now? I'm sitting there, they know that I'm getting mad. He darn well knew that I wouldn't appreciate that then. After all this other stuff, after them being told this other stuff and then to do that. He's smart enough, he knows that that was not the time, but he did it anyway, you know.

Teacher 1-2 illustrates the managerial subsection of the

administrative/managerial variable when a pupil could not find his

material:

> T: I was feeling just a little annoyed here because that, I
> don't like to spend my time doing these things, like
> getting a pencil and getting these children to sit back
> down again and get busy. I always feel, "Hey, you're
> wasting my time here, don't do that, just do," you know,
> on the other hand but it's a child thing to do.

Another illustration of the managerial variable comes from

teacher 1-3 who stated:

> T: At this point right here, this little guy in here I know I
> was starting to get a little bit frustrated with him
> because he came out to get scissors again, he has a
> continual thing with the scissors, he's always losing
> scissors and when I had to get up and leave the reading
> group because he couldn't find scissors again, well it
> was kind of a little bit of distraction that was too much
> type of distraction. I had to pull the students away
> physically from their reading books.

Climatic

This sub-variable refers to the potential influence of the

weather upon the teacher, and therefore her subsequent interactions

with the pupils or it can refer to the influence of the weather upon

the pupils and their subsequent interactive influence upon the teacher

and future teacher-pupil interactions. Teacher folklore abounds with

references to the influence of weather upon the pupils and how pupil

behavior influenced teacher behavior. However, in this study only

four references were made to the influence of weather and this

apparent influence did not appear to determine teacher behavior in any

gross sense, although there may have been subtle changes in instruc-

tional tactics that were not detected by the research design and

methodology employed in this study. Teacher 1-2 revealed her thoughts

about the prevailing climatic conditions:

T: It's so hot and they were tired and they didn't really
    want to be there and I didn't really want to be there but
    we had to put in the time till 3 o'clock and really we
    would have been better off down by the creek.

I: Was that going through your mind then, "better off down by
    the creek?"

T: Yes.

Teacher 3-3 when revealing her thoughts about pupil lack of
response in a social studies lesson rationalized by referring to the
influence of the weather:

T: Now I knew they would be more interested in this than they
    had been in the other, but I didn't think they'd be really
    interested in this. Not enough to leap into it because,
    they're so hot and they're so tired, they're not really
    listening to anything.

Teaching Style Variables and
Overarching Principles

Teacher's Role Conception

Variables grouped under this heading deal with a number of
dimensions of the teacher's role conception as well as general aspects
of a teacher's style that influenced her behavior in the classroom.

The interactive data indicated that several of the teachers
held clear conceptions of how they should "play" their role as
teachers. This role definition shaped the way the teacher interacted
with the pupils and was in some cases found to be germane to a
particular lesson and in other cases was consistently influential
across both lessons taught. Teacher 3-1 attempted not to be the
director of all interaction in the classroom and illustrated the
consistency of this role conception when she reported in her social
studies lesson:

T: When I stop them like that, the one thing I really try is to get them to listen to each other's interactions rather than have it strictly student-teacher reaction. I like to have a reaction back and forth between them and not have me as the centre role and I do that by getting them to listen to each other's comments and to comment on each other's comments.

This role concept was also illustrated in teacher 3-1's language arts lesson when she stated:

T: There I tried again as I explained in the last tape, get them to listen to each other rather than listen to me. And X had an idea and Y was talking and saying his own idea and I wanted him to listen so that the interaction was between them and not between me.

Teacher 6-2 in a social studies lesson pointed out to her class that it could be embarrassing to laugh at others' mistakes and in doing so she indicated that she should not be expected to accept complete responsibility for the social development of the pupils:

T: They just really don't exhibit any sort of compassion towards each other at all and they don't spare each other's feelings and really as far as manners go, I could be pointing things out to them all the time, but I bite my tongue and don't because I don't feel it's completely my job to see that these kids are brought up properly.

Use of Peer Tutors

The use of peer tutors is also illustrative in some cases how a teacher conceives her role. Teacher 1-1 illustrated this point in her language arts lesson:

T: And I said, "Go ask X, he doesn't seem to be doing anything," . . . and I was pretty sure he'd know how, so I thought, there's no reason why I should have to teach her. Eighteen other kids in the class know how to work it.

Teacher 6-2 also indicated her use of peer tutoring when she pointed out to the researcher a case in her language arts lesson where some pupils were assisting others with their work:

T: They are allowed to help each other out . . . I don't discourage that ever, if there's somebody doing somebody's work for them it's different. But I certainly don't mind them turning around and helping each other with the problem. Some of them would rather do that than come up and ask me, which is fine . . . . The kids have a way of explaining things at their own level too. Sometimes better than I can explain things to them, so in math, for example, I often say, "If you don't understand something, you don't have to just come up and ask me, ask your neighbour," and I always emphasize this. Maybe I have been speaking over their heads and somebody who has picked it up can say it on a much simpler wave length than I could myself.

Student Involvement in Decision Making

Six of the nine teachers involved their pupils in decision making and thus illustrated another dimension of how they conceptualized their role as teachers. The three first grade teachers gave their students responsibility for selecting their own reading books on the assumption that the pupil, if allowed to make his own choice would choose a book he was interested in, and therefore, be motivated to read. The first grade teachers respected the pupils' autonomy of choice and while at times disagreeing with a student's choice, did not forbid the student to read the story. For example, teacher 1-1 stated:

T: I was preparing to be very bored with this one. She should be reading at a higher level than she is but they have free reading, free choice and I keep trying to discourage her from this book because it's a way too easy for her.

Later in the same lesson, this teacher attempted to interest a pupil in a puzzle game, but did not persist when the pupil showed no interest in becoming involved, "I was trying to get him interested in something like that and he just said, 'hmmm' and walked away."

When teachers involved the whole class in decision making they

used a voting system with the majority group permitted to make
decisions for the whole class. Teacher 3-1 illustrated this principle
during her language arts lesson and abided by the pupils' decision
even though she disagreed with it:

> T: Right here I tried to use the democracy thing because
> usually when we have two ideas I make them vote on it
> because then they realize the majority rules and they
> don't get mad at me or consider me the dictator and so I
> usually always have a vote on it. But right here, I was
> kind of favouring one of the other ones . . . . But they
> all voted against me so I just accepted it and went on.

Later in the same lesson teacher 3-1 indicated that because
the pupils were involved in decision making then they had to accept
responsibility for their decisions. When commenting on the direction
the lesson was taking, this teacher stated:

> T: I knew it wasn't a good choice. I could tell at this point
> the story wasn't going to develop very well but I figured
> it's their choice, they're going to have to work with it.

The Principle of Teacher Authenticity

This general principle, also called "Honesty of Encounters" by
Bussis and Chittenden (1970), deals with the teacher presenting herself
as a human being who is approachable and is not infallible. Sometimes
the "mistakes" the teachers make are accidental and sometimes they are
deliberate. It appears that teachers invoke this principle for a
variety of reasons as the quotations from several teachers illustrate.

This principle could be considered another dimension of the
teacher's role conception. However, because of its prominence, and
exhibition by all teachers, it has been considered as a separate
variable.

It should be noted that at times when explaining use of this
principle, the teachers' thoughts moved from the interactive to the

non-interactive domain.

Teacher 1-1 illustrated this principle when she told the class she was unable to read a word:

> T: I get, I say they were called and then I look at the word,
> I know I'm not going to be able to read it and I say, "Well
> that one I can't read too well." I don't mind doing that
> with the kids, they have to know that I can't read every-
> thing either. They start out thinking that teacher knows
> everything and does everything right and they've had many
> examples through the year to show that I'm not infallible.

Teacher 1-2, when discussing a reading story with a group of children, illustrated her use of the principle of teacher authenticity:

> I: Did you have any particular thoughts or feelings at that
> stage, you were talking about "no?"
>
> T: That I wouldn't want mice and ants in my house either so
> I was just putting in sort of a personal kind of thing.
> That was just a little thing but they like it when I
> talk about my kids, my own and the funny things they do . .
> . . I think it makes them think that I'm more a real
> person, that does normal sorts of things.
>
> I: Why is that important?
>
> T: Well I think that helps them realize I'm a person, not
> just a teacher, I'm a person. They always like it when
> they see me in a store, that kind of thing.

Teacher 1-3 used this principle when promoting a relaxed, happy atmosphere in the classroom:

> T: It was a mock "yes." And they knew it too. They like to
> see you horrified, they like to see you surprised and I
> will occasionally do that just to satisfy their feelings
> of having done this to the teacher.

Later in the same lesson teacher 1-3 again illustrated this principle:

> T: And the people one, I just threw that in for a joke on
> them . . . I'll do that to them or I'll try to trick them
> and we trick them on something, because they get a real
> bang out of this. This is really neat, they think she
> can't trick us, type of thing, and they like it and there's
> time for it in the classroom, there's a little bit of
> fun, you have to have fun with them and there's times
> when they can trick me, which I allow them to trick me . .

. . And they felt real good for that point because she didn't get us.

Teacher 3-1 in her social studies lesson also used the principle of teacher authenticity and explained her reasons for using it:

> T: What I was thinking of there is I try and really keep on a personal level with my kids and they really enjoy hearing about my cats, sometimes I tell them dumb things my cat's done or some things my husband, I mention Mr. X once in a while and personal incidents that involve me because I like to keep on a personal level with the kids and I find they really enjoy it better, especially at that grade level.

In explaining why this was important in her teaching, this teacher stated:

> T: I feel that if they have problems they'll be more likely to come to me because they'll have confidence and trust in me. I suppose one of my things is that I want my children to trust me and to be confident in me and express a lot of faith in me I suppose, and this I think is one way of doing it.

Teacher 3-3 also invoked the principle of teacher authenticity so that she would be approachable to her pupils and also because she believed a teacher should not give pupils incorrect content information. These points are illustrated in the following quotation from this teacher's social studies lesson:

> T: I try not to be awesome. . . . You notice lots of times when they're asking things, if I don't really know I would rather say, "I don't really know, this is what I think." But I like to make it clear to them that this is not God's given truth. Like when that kid asked how many toes do the early horses have. Now I think it's four, but I don't know for sure, that's what I think, than say four. I don't think that's reasonable to do that . . . I don't think you should be a source of misinformation if you can help it . . . I don't think that's reasonable because they have a lot of faith in me.

The three sixth grade teachers also indicated use of the principle of teacher authenticity. For example, teacher 6-1 explained:

> T: Oh they always do that, well they like to correct me. I didn't mind it, sometimes I make a joke out of it. I mean everybody makes boo-boos.

Teacher 6-2 had been unsuccessful at a task and told the pupils so. She explained:

> T: And I like to bring my own experiences into it, so that the kids can sort of identify with me, I'll often say, almost call myself down in certain situations to make them look better, and that was a situation.

The Principle of Suppressing Emotions

Macro-analysis of the transcripts revealed that all teachers expressed use of this principle. Essentially the principle refers to the fact that the teacher masked her feelings from the class or in some cases a pupil. The teachers suppressed their emotions in a variety of situations and apparently for a variety of reasons. However, as Marland (1977) pointed out, "At times, mainly when they were under duress, teachers strove to suppress the feelings they were experiencing" (p. 219). This suppression of feelings was used as a class management strategy or was a reaction to pupil misbehavior.

Teacher 3-2 waited quietly and took no apparent notice of her class during a noisy period of interaction:

> T: That annoys me. That I feel is disruptive noise. And that is why I stop. I've got two or three little song birds, you will notice when I give a pause like that and usually I will look away from them, when I do so they know I'm not responding to them.

Teacher 6-1 spoke quietly to a student about his noise-making in the class. However, her manner did not indicate her extreme degree of annoyance.

> T: I just wanted him to be quiet, you know, I could have shaken him or something but that wouldn't have done any good. I mean there is no big deal making a big scene, I

have learned that the hard way.

This principle often appears in association with another principle. For example, teacher 6-3 illustrated how this principle can operate, and is controlled by the principle of "Teacher Self-Monitoring."

> T: The thing that was going through my mind at this point was impatience, that you would say something and . . . they would ask almost exactly the same thing but worded a little bit differently. I get very impatient with that and especially that day. The night before I had about an hour's sleep all night, so I was very cranky that day. I was restraining myself, I was constantly thinking, you know, O.K., I am not going to react to it because it's not the kids' fault, a lot of it is mine.

Teacher 6-2 illustrated how the principle of "Equality of Treatment" interacts with the principle of "Suppressing Emotions" in order to have a mediating influence upon a teacher's interactive behavior.

> T: With the child that is continually doing this over and over again you naturally do become irritated with this kind of irresponsbile behavior. But at the same time you try not to let on, to the rest of the group, you try not to let on these differences in feelings either. This is where you have the problem, with the child thinking, "Gee I'm getting picked on," or "She likes so-and-so better than me," and this sort of thing. It's feelings you have to fight.

Teacher 6-2 also indicated that observance to this principle is not always possible to maintain.

> T: So you have to hide it and sometimes it's very impossible, like on another day if I've had a particularly rough day or had a headache or something I might have blown up at X.

Teacher 6-1 indicates how violation of this principle can be used as a management strategy:

> T: I've learned the hard way there's no use just blowing it although sometimes I just do blow my top. It doesn't

hurt I think sometimes if the kids realize how upset that I am with them you know. They really listen, but it wouldn't work all the time.

Finally, as Marland (1977) found, teachers invoke this principle to maintain pupil self-concept. Teacher 6-3 illustrates this point:

> T: She spent about one minute there and she's still got her own paper. I am ready to, my reaction is boy, I'd love just to belt the desk there . . . but I didn't because she is a weak student and I didn't want to discourage her too much.

The Principle of Teacher Self-Monitoring

In this study, the principle of self-monitoring is used in a narrow sense to refer to teacher self-awareness or self-criticism. This principle illustrates the teacher's ability to reflect critically about her teaching. The teacher is evaluating her performance and is showing awareness of the effect it could have upon the pupils' behavior. Self-monitoring is not used in the more broadly accepted sense where teachers directly solicit feedback from their pupils concerning their teaching. However, in a number of cases in this study teachers were given indirect, unsolicited feedback from the pupils' overt behavior.

All teachers displayed self-monitoring behavior. There were 226 instances in the self-awareness category of the micro-analysis that indicated teachers were evaluating their own performances and analysing the effects of their behavior upon the pupils.

Self-monitoring can be viewed as relating to specific incidents and secondly, relating to teachers' habitual behavior patterns. Some examples of self-monitoring behavior are illustrated from the

transcripts of teachers 1-1, 1-2, 3-2 and 6-3.

> T: The second before I asked what it was, I thought to myself, why did I put this one first, it's the least recognizable of all the five that I chose . . . and I thought, they're not going to know this one, I should have started with one they really know well, Brontosaurus and so on.

> T: They said it sinks and then again, I felt, wrong vocabulary, wrong kind, worded the question wrong again.

> T: That rather bothered me there a bit, because her question, I felt at that point I hadn't gotten the other points across to her at all. So I thought O.K. it does need clarifying.

Finally, teacher 6-3 illustrated her reaction to a specific

incident:

> T: I'd blown it and I had known that I had blown it and I was trying to get my thoughts back on line.

At times as teacher 1-3 illustrated, a teacher's reaction is

not negative towards her behavior.

> T: At that particular point in the film there when we were sounding out that word I kind of thought to myself that was a good way of teaching the sound "sh" you know, they had two vowels walking hand in hand.

On a number of occasions, teachers questioned their habitual

behavior. This is illustrated from the transcripts of teachers 1-2

and 3-1.

> T: Right there I put my hand on my hip and I wondered, I wondered if I look like I'm grouchy when I do that? Because I do that quite often and as I was standing there I thought, I wonder if I look like I'm cranky?

> T: The repeating all the time, perhaps I wonder sometimes if I overdo it, but they find it so hard to follow instructions.

Idiosyncratic Intrusion

This major variable describes a strongly held belief or

personality characteristic of the teacher that is instrumental in motivating her to act and thus influences the interaction between teacher and pupils. This variable intrudes into the flow of the lesson and influences the teacher to behave in a manner that is not consonant with the lesson's objectives or her expected behavior in that lesson. Idiosyncratic intrusions were exhibited in the lessons of teachers 1-1, 1-2, 1-3, 3-2, 3-3 and 6-3. Some examples of this variable illustrate the variety of its form. In her social studies lesson teacher 1-1 reported:

> T: I take every opportunity when the kids mention any kind of hunting or violence or anything, like that's one comment X made, "If I saw that in my backyard I would shoot it with my bow and arrow." I might let something like that go, I mean he was just throwing that in, but I grabbed at that and said, "Why would you do that, it's not going to hurt you?" Trying to implant this idea that, against the violence, anti-violence, anti-hunting and things like that. Every chance I get I throw that in because that is something that I picked up on that I would, the kind of thing I would let go but because of what he was saying about killing it with his bow and arrow I did pick up on it. I heard it and stopped to say something about it.

Teacher 1-2 also indicated how her strong feelings concerning violence influenced her teaching:

> T: I don't like kill. But one child said they kill, as a personal thing I don't like to talk about killing and shooting and that kind of violent thing . . . I didn't want to discuss that, I didn't like using those words, I guess it's a personal thing for me.

Later in the same lesson teacher 1-2 reported:

> T: And I knew from the conversation they wanted to get into this ripping and tearing and fighting of the dinosaurs and I sort of wanted to avoid that, so in my mind I thought, I'll qualify it now, he's a plant eater and go on from there.

Teacher 3-2 illustrated on a number of occasions how an

idiosyncratic intrusion related to her personality influenced her
"moves" in the class. In her language arts lesson the teacher
reported:

> T: At about this point the kids started crowding in on me.
> I have a basic, a claustrophobic personality. I hate to
> be enclosed and yet I felt at the same time, I have to
> share with them, I have to develop, I have to point if
> they're getting off track. But still I get that closed-
> in feeling when they all come to me like that at the one
> time and I mentally have to fight myself that I don't
> push them away, I don't turn them off and yet I have my
> own personal feelings to deal with. I find it difficult
> . . . and sometimes I do push them away because it gets
> too much. I'll simply walk away and say, "O.K. back to
> your seats," and I'll change pace because it is getting
> to me too badly.

Teacher 3-2 did react to the "pressure" as she reported:

> T: I was feeling the pressure there, the kids coming towards
> me, and so I sat down. This is a bit of a defensive
> reaction on my part. I feel this way I can funnel them
> coming from one or two sides and not from all sides.

Later in this lesson, teacher 3-2 did push pupils away from
her as they crowded in. This same motivational influence was
indicated in teacher 3-2's social studies lesson:

> T: This right here bothered me and I knew it would eventually,
> in the class because some of the kids didn't want to
> come up to the front, I'm uncomfortable, like I mentioned
> in the last lesson, when kids are behind me.

Later in the same lesson teacher 3-2 recalled:

> T: I was so conscious of those kids sitting there behind me
> and I had to get out of there.

Teacher 3-2 revealed the influence of another idiosyncratic
intrusion in her social studies lesson when she strongly emphasized on
a number of occasions the influence of the U.S.A. on Canada even
though the lesson was about Japan:

> T: Here I wanted to get around one of my bugaboos. I feel
> kids just do not know enough about their own country, and
> they're studying other countries. And many children, even

Grade 6, Grade 7, have the idea that we have a president. They can't differentiate between president and prime minister, and I have this thing about the media, we get so much exposure to American thoughts and I want here to again reinforce, that we aren't American, we are Canadian . . . . Every time I hear the word president I get uptight.

Later in the lesson teacher 3-2 discussed the role of the Japanese Emperor in relation to the government of Japan. She then introduced Queen Elizabeth:

I: Did you have any particular thoughts or feelings when you introduced Queen Elizabeth?

T: Yes, that's my old American bugaboo coming through again. I feel the children know far too much about the United States and not, it's not that they know far too much, it's that they're far too exposed to American ideas, concepts and situations and they're not exposed to our own. Perhaps the Queen is an outdated thing but still she relates to Canada and I wanted the awareness built there.

Teacher 6-3 showed concern and was conscious of her hand movements while teaching and clasped them or put them behind her back in order to minimize her use of gestures.

T: Well the kids noticed this too . . . I've always had this problem with my hands in my teaching . . . I think it detracts. I think you have to be careful when you're doing it.

General Pedagogical Principles

Macro-analysis of the transcripts revealed that there were a number of pervasive principles that exerted an influence upon teachers' classroom behaviors. While these broad principles have psychological bases they are to be distinguished from the more specific psychological principles such as motivation, reinforcement that are discussed elsewhere in this chapter.

The Principle of Cognitive Linking

This principle refers to when the teacher begins a lesson with some commonly known referent and then makes a transition to new material. It appears that this principle relies on broad theoretical notions of information processing, where the importance of existing cognitive structure in acquiring new knowledge is stressed. The teachers in this study appeared to base their use of cognitive linking on several theoretical grounds. First of all in interrelating relevant aspects of subject matter already familiar to pupils or relating new knowledge to what pupils know or have previously experienced there is the assumption that such links enable pupils to fit knowledge into existing cognitive structures, thereby enhancing understanding and retention. Secondly, if such links are related to important pupil concerns or interests as understood by the teacher, then it could be assumed that internal motivation might be enhanced, and learning promoted.

All teachers in the study revealed use of the principle of cognitive linking. Teacher 1-1 when commencing her social studies lesson reminded the pupils about the previous lesson. When asked to reveal her thoughts at this point the teacher explained:

> T: A way of reminding the kids that we did start it and we're just going to continue with that. Remind them that they were interested yesterday and we're going to finish. It was just introducing the whole thing of dinosaurs again like this is what we're going to do now and we are continuing with something that we started yesterday, just to get their minds rolling in the right direction.

Teacher 1-2, also dealing with the topic of dinosaurs, used questioning tactics to structure the cognitive linking with the previous social studies lesson.

I: What were you thinking when you asked them that question?

T: I wanted to see what they remembered, because we had talked
     about it before. So it was a recall of knowledge . . .
     that was to bring in. To me it seemed the logical way to
     start the lesson . . . recalling what dinosaur meant, it's
     about dinosaurs so.

Teacher 3-2 used cognitive linking as a review technique and
also as a means of developing a new concept:

T: Here I wanted them to relate back to what we had already
     talked about in the way of agriculture. I like to bring
     in review where I can, and also to get across here I
     wanted the idea that the import and exporting countries,
     that things don't always flow one way or another.

Finally, teacher 6-1 indicated how she considered cognitive
linking assisted in pupil understanding of concepts and in placing the
lesson in context:

T: But I like to more or less begin with a bit of discussion
     . . . . I like to tie them [lessons] in a bit. I feel
     that sometimes some of them really don't grasp the
     concepts or they'll come out with silly questions, you
     know, "Why are we doing this?" and stuff like that, and
     if they understand. I find that if I keep sort of tying it
     in it is better.

The Principle of Integration

This principle refers to when a teacher crosses subject area
boundaries and uses the lesson content under discussion to present
skills or concepts that would normally be dealt with in another
subject area. It also refers to the fact that skills, concepts and
materials dealt with in one subject area are used to reinforce the
retention or further the understanding of skills and concepts raised
in other subject areas.

The use of this principle at times was deliberately planned,
at other times it appeared to be part of a teacher's internalized

instructional style, while at other times it appeared to occur quite
spontaneously and was used to give relevance to the teaching of some
skill or concept.

Examples of the various uses of the principle of integration
are illustrated from the three grade levels.

Teacher 1-2 indicated in the social studies lesson that
integration was part of her instructional style:

> T: Whenever I can I try to get books into anything, so any
> study like that, we try to get as many, I want them to
> get into the books . . . I want them to find out or
> realize that reading is not a skill, it's more than just
> a skill that you have to do at 9 o'clock in the morning
> and that it can be, you can find out things from books as
> well as enjoy them . . . . I integrate language arts into
> everything.

Later in the lesson the teacher again referred to the
integration of books into her present work.

> T: This again is where I wanted to get the books into it and
> that's why anything connected with the book, finding the
> pictures or whatever.

Teacher 3-2 also indicated how the principle of integration
was a normal aspect of her teaching style. During her social studies
lesson she reported:

> T: Here I wanted to do a little bit of vocabulary experi-
> menting as well. I try it in most of my lessons if I can
> . . . . I was relating it over to language arts because
> we spent about the last three days analysing compound
> words and I thought it was a good way to make the
> correlation then, to see if they've learnt anything too.

Teacher 6-3 in her social studies lesson also integrated
language arts into the flow of the lesson:

> T: Here's where I come back. I was thinking O.K., here's a
> spelling mistake, let's put this on the board, let's
> reteach it again, the spelling. And that's what I was
> thinking.

When asked why she took the opportunity to teach spelling then

the teacher explained:

> T: Because it was convenient. You can't reteach everything
> but you try to fit it in to your general pattern, so you
> can teach it, as you go along you can come back and you
> can get something that was missed before.

Finally, the thoughts of teacher 3-1 in her language arts
lesson indicate the spontaneous use of integration of social studies
concepts and language arts:

> T: It had hit me as I was going along that this would be good
> to bring in some of the things that I talked about Japan.
> You could bring in geisha girls and kinds of houses so I
> was kind of pushing for them to develop that idea.

Later in the same lesson teacher 3-1 again illustrated how her
future lesson planning was taking account of the principle of
integration.

> T: Right there, the thought that hit me is there's a book in
> the library called "The Emperor and the Nightingale" and
> I was just mentally saying to myself I should bring it in
> and read it to them because they'd be interested in it as
> a language project and also as social because it's about
> the Japanese Emperor.

The Principle of General Involvement

This principle is broader than the principle of involving
discussed in the instructional moves category which emphasized the
active involvement of a pupil in an activity and "learning by doing."
This principle of general involvement refers to when the teacher
involves pupils in the lesson to develop some aspects of their person-
ality, to socialize them into the classroom scene or to minimize the
influence of the teacher's role in the lesson.

All teachers invoked this principle and believed it was
important, for the reasons stated above, and for other reasons not
clarified, that all pupils should become involved in the lesson. The

application of this principle was found in those aspects of a lesson
involving discussion. Some examples will illustrate the use of this
principle.

Teacher 3-1 in her social studies lesson chose a pupil to write
comments on the chalkboard and commented, "I chose X because she's a
very quiet student and poor speller and poor writer, never gets picked
for these kinds of things so I deliberately chose her, to give her
some more confidence."

Later in the social studies lesson teacher 3-1 invoked the
principle of general involvement to draw certain "personality types"
into the lesson. When asking a non-volunteer a question, she explained,
"I chose Y there because she hasn't responded at all throughout the
lesson. She hadn't raised her hand at all and very often when a
student doesn't show their hand they're shy."

Teacher 3-2 also expressed a conscious desire to involve non-
volunteers in a discussion session. She commented in her language
arts lesson, "I feel a conscious need to with these kids, to draw in
the ones who don't always put their hand up." Teacher 3-2 illustrated
this "need" throughout both her lessons. For example, "X is a very
insecure little girl . . . in group discussions she'll hold back. So
I picked her out there, she'd done a lot of listening but no contri-
butions so far."

Teacher 6-2 used the principle of general involvement to assist
in socializing a new student into the classroom. When asking the
student to assist her with an organizational task, teacher 6-2
commented, "He's a new student, he just came in last week, so I've
tried to get him involved in as many things right now as I can."

Teacher 6-3 used the principle of general involvement in order to have the pupils participate in a discussion session and to lessen the dominance of her role in this mode of presentation. For example:

I: What was your purpose for asking the child to read it out at that stage?

T: At that stage to involve them in the lesson, rather than have me do all the talking. Again it gets them participating, gets them involved . . . I try to at different times get the students involved because I think I talk too much anyway."

Teacher 6-3 also indicated a determination to involve all children in a discussion, especially those quiet and withdrawn. Her motives for this strategy were not always clear.

T: The reason I picked that one is because she is a very quiet kid and she sometimes gets by without any questions. There are two kids in there that sometimes gets by without me asking them any questions, because they don't say anything and they don't participate. . . . Those two I always try to bring in one way or another by questioning or discussion.

The Principle of Equality of Treatment

This principle refers to the fact that the teacher attempts to treat all children equally and consistently when they are in a group situation. It can also refer to the fact that some teachers when punishing children for the same offence do not discriminate among those to be punished. This principle appears to be based upon psychological principles of motivation and concept development and is closely linked to the principle of general involvement.

At times, when the principle cannot be observed some teachers indicated emotional discomfort. This can be illustrated with quotations from the transcripts of teachers 1-1 and 3-2.

T: I can see they've got a lot to contribute and I'm going to

have to cut them off and I hate doing that and I was probably thinking well how am I going to get myself out of this as quickly as possible and get on to what we were supposed to be doing.

I: Why do you hate cutting them off in discussions like that?

T: Because by the time I have to cut anybody off, some have had a chance to say something and there is more that want to say something and they're all, why should some get a chance and some get something, it's all important to them whatever it is they have to say and I don't want to hurt, you know, say yours isn't important and I listened to this one but yours isn't going to be important, so I don't want to hear this . . . . I don't like doing it. It often seems to be the same kids.

Teacher 3-2 expressed similar emotions, but also indicated how she compensated any pupils for missing out on involvement in some section of the lesson.

T: And I know myself that if I was really wanting to express myself on a point and somebody cut me off I'd feel badly. I'd feel disappointed, let down and I presume that's how they feel at this point when they say, "Oh!" . . . . So I try to include them, the ones who have been so keen, in the next part, if at all possible.

Analysis of this teacher's videotapes indicated that she did make conscious efforts to involve all pupils who wanted to keenly participate in a discussion session. This teacher also invoked the principle of general involvement quite consciously and when one considers this teacher's preoccupation with the ecological factor of time then discussion lessons can become "finely balanced interactive sessions" where various guiding principles are balanced against each other. Which principles or factors would dominate and thus determine the flow of the lesson, would possibly vary from lesson to lesson. However, this is only speculation, and this area is one that is in need of future research.

Teacher 6-2 illustrated another dimension of the principle of

equality of treatment with this quotation from her social studies lesson:

> T: Now X is different, she is a very conscientious student but I didn't treat her any differently than Y again. She forgot her name, she knows what she's going to have to do. I have to be consistent about these things as well, no matter the student and no matter the circumstances.

Finally, it should be pointed out that what might seem capricious behavior on the part of the teacher is in reality, an application of this principle. Teacher 1-1 had been ignoring some pupil comments and suggestions in a social studies discussion lesson and only probing questioning revealed the use of the principle of equality of treatment.

> I: Would you pay more attention to someone else making comments?
>
> T: Not like that, not that kind of comment, it's the comment I try and discriminate within, among, rather than the kids.
>
> I: So you'd ignore comments like that from anyone in the class?
>
> T: Yes if they made that but some kids of course make them more often so it would seem like I am ignoring the child more often than others.

The Principle of Closure

This principle refers to when the teacher is bringing to a close a teaching-learning encounter. This encounter may be at the conclusion of the lesson or at the conclusion of a discrete segment of the lesson. This principle usually involves the teacher reviewing and evaluating key points so that the main facts, skills or ideas covered are recalled. The review involves the participation of both teacher and pupils and generally involves a question and answer session. Often a summary is placed on the chalkboard.

Closure seems to be based on several assumptions. First of all, that repetition is important in learning and secondly, if attention and motives have been aroused and links between new material and the known material have been established, then for the pupil, reviewing provides an external reference against which he can check any modifications made to his own existing organization of concepts and ideas as a result of the lesson.

Only five instances of closure were revealed in the transcripts, including two by teacher 1-2. This teacher indicated use of this principle in her language arts and social studies lessons.

T: Just a quick review, bring it all back into, collect it all together at the end just before giving out the sheets.

I: And what's the purpose behind collecting it all together?

T: So it's all you know, because the reason for the lesson is all right together in their heads, ready to use when they go to their desks.

In her social studies lesson teacher 1-2 recalled:

T: Tie it all up, finish it all up, just recall all the facts sort of briefly, and sort of end the lesson.

In supporting her thoughts, this teacher explained:

T: Oh just sort of at the last minute, sort of at the end put it all together so that they recall the details and I don't know, somehow it seems to stick together then . . . because after this long discussion you don't really know what stays in the head. And so we just took out all the facts and put them together as a neat little kit . . . to remember.

Teacher 1-1 in concluding a segment of a lesson also illustrated this principle when she stated, "I was trying to bring everything out that we talked about."

Finally, teacher 6-2 revealed her use of closure in a language arts lesson:

T: I want to sum up the lesson and I want to discuss and go
    over it . . . I think it is important to do it while they
    still remember it.

SECTION D

<u>Low Inference Classroom Observation Data</u>

The expanded Brophy-Good Teacher-Pupil Dyadic Classroom
Observation System was used in this study to gather data that would
support and assist in the interpretation of the covert data reported
by the teachers. Therefore, these data were gathered to assist in the
answering of research questions one to four. This system is designed
to capture a large slice of classroom life. It records interactions
between teacher and pupils in public or interactive sessions involving
the whole class as well as interactions that occur in private dyadic
situations. The system captures a variety of dimensions of both
teacher and pupil verbal behavior. It reveals the quantity and
quality of questions asked (simple cognitive memory or higher order),
whether non-volunteers or volunteers were asked, and the quantity and
quality of the teacher feedback. For example, feedback includes
information to the pupil concerning the correctness of a response, as
well as whether the teacher strongly emphasizes positive or negative
reinforcement.

As well as recording pupil responses to teacher questions, the
system records student initiated questions and comments in any public
response section of a lesson.

The system also records private dyadic contacts between
teacher and pupil and indicates whether they were teacher or pupil

initiated, work related or of a personal nature and what type of feed-back was given by the teacher. The system also records classroom managerial and behavior-related interactions.

The low inference data also reveal sequences of pupil, as well as teacher behavior. As the data are used in this study to assist in the interpretation and corroboration of the stimulated recall data it will therefore, focus dually upon trends common to all the teachers in the study as well as upon the behavior of specific teachers in specific lessons. Some aspects of the data are now highlighted.

The data in Table 16 have been presented in summary form by combining several linked sub-categories and by omitting sub-categories that are not illustrative of the teacher's behavior, when such behavior is considered in relation to the research questions posed in this study.

All nine teachers in this study provided their students with a supportive climate. Only three teachers, in a total of seven instances criticized pupil responses to teacher questions. The three teachers who were critical of pupil responses all came from the sixth grade level. This low level of criticism on the part of the nine teachers was found throughout different teacher-pupil contact situations. Table 16 reveals that in whole class situations when pupils initiated verbal exchanges with questions or comments, only five teachers in a total of seven instances criticized pupil verbal behavior. In dyadic contact situations the level of criticism was again very low. There were four examples of criticism from two teachers when pupils created the contact, and 12 examples from three teachers when the contact was teacher initiated.

Table 16

Summary of Low Inference Process Data

Teacher	Ask Non Volunteer	Ask Volunteer	Call Out Answer	Process/Opinion Q.	Product/Choice Q.	Answer Affirmed/Accepted	Answer Praised	Answer Criticized	Questions (Relevant and Irrelevant)	Teacher Respond	Comments (Relevant and Irrelevant)	Teacher Accept	Teacher Praise	Teacher Criticize	Teacher Ignore	Work-Related (Content and Process)	Personal	Praise	Criticism	Work-Related (Obs. & Brief & Long)	Praise	Criticism	Procedural (Favor and Managerial)	Behavior Related (Warning--Criticism)
					Response Opportunities — Teacher Initiations							Student Initiations				**Dyadic Teacher-Pupil Contacts** — Child Created				Teacher Initiated				
1-1 Lesson (L/A)	18	20	3	3	39	28	8	0	1	1	9	6	1	0	3	29	15	3	2	28	5	3	19	27
Lesson (S/S)	6	9	6	9	9	13	1	0	0	0	25	11	2	1	8	18	8	1	1	21	2	1	3	4
1-2 Lesson (L/A)	23	2	10	8	29	32	5	0	1	1	2	1	0	0	0	16	7	2	0	10	1	0	5	6
Lesson (S/S)	2	13	16	17	14	17	3	0	4	4	23	15	1	0	3	3	4	0	0	3	0	0	14	8
1-3 Lesson (L/A)	30	11	29	31	35	47	3	0	2	0	9	6	0	0	1	26	23	0	0	19	1	0	13	12
Lesson (S/S)	2	11	17	15	14	19	1	0	2	1	18	15	0	0	1	12	13	2	0	11	1	0	3	3
3-1 Lesson (L/A)	10	49	8	40	22	38	3	0	5	5	4	4	1	0	0	6	1	0	0	21	4	0	9	7
Lesson (S/S)	5	26	9	6	34	20	4	0	11	10	23	14	2	1	7	14	2	0	0	11	0	0	5	6
3-2 Lesson (L/A)	5	23	2	33	4	30	2	0	0	0	5	26	0	0	1	35	8	2	0	6	2	0	7	11
Lesson (S/S)	21	40	19	38	33	54	4	0	10	9	7	4	0	1	0	0	4	0	0	0	0	0	3	6
3-3 Lesson (L/A)	2	1	13	2	10	8	2	0	2	2	33	26	0	0	5	1	6	0	0	14	3	0	10	14
Lesson (S/S)	1	6	8	2	10	6	1	0	16	12	19	15	0	0	0	0	2	0	0	1	0	0	1	6
6-1 Lesson (L/A)	9	23	3	2	32	24	2	2	11	9	13	7	0	1	4	10	2	1	0	24	4	2	5	5
Lesson (S/S)	4	11	0	2	11	7	2	0	8	7	7	6	0	1	0	16	6	2	0	32	4	1	6	19
6-2 Lesson (L/A)	9	10	1	0	15	10	0	1	2	2	0	0	0	0	0	15	6	3	0	29	4	0	4	3
Lesson (S/S)	108	16	0	0	122	65	4	1	0	0	3	3	0	0	0	10	0	0	1	9	2	5	0	8
6-3 Lesson (L/AD)	2	0	0	0	0	2	0	0	4	3	3	3	0	0	1	3	0	2	0	14	2	0	7	1
Lesson (L/AP)	18	20	1	1	37	25	4	0	2	2	7	7	0	0	0	2	0	0	0	3	0	0	11	2
Lesson (S/S)	18	21	1	22	21	27	2	3	31	28	5	4	0	2	3	2	1	0	0	7	0	0	3	0

Teacher feedback, concerning the affirmation or acceptance of the student's response was also a noticeable supportive feature exhibited by all the teachers with the feedback at times including strong positive reinforcement from the teacher in the form of pronounced praise. Analysis of Table 16 indicates that when pupils initiated contact with the teachers through a question or comment, the teachers responded to the question or accepted the comment in a majority of the instances. A totaling of student initiated questions and comments indicates that the teachers responded to 96 out of 112 pupil initiated questions and accepted 150 out of 215 pupil initiated comments. Only 37 out of a combined total of 327 questions and comments were ignored by the teachers in the 19 lessons videotaped. The majority of these ignored verbal behaviors occurred in lessons where teachers were encouraging or permitting pupils to call out, with the result being, the teacher could not respond individually to each child.

The teacher's style of asking questions, the type of questions asked, the type and degree of pupil participation in the lesson and the teacher's general verbal behavior were of course related to the lesson objectives, lesson presentation mode and teacher recognition of certain beliefs and use of certain principles. The low inference data will be related to teacher beliefs and use of principles in Chapter VI. For the present, several features of individual teachers' lessons, as indicated by the low inference data, are now presented.

Teachers in first and third grade in discussion sessions not only encouraged pupil questions, but encouraged other verbal participation in the lessons by allowing pupils to freely interject and

express their thoughts in the form of comments. This was not the case with the sixth grade teachers who generally tended to channel pupil initiated verbal behavior into the more formalised question-answer format.

The type of pupil involvement varied from lesson to lesson, however, there was a tendency as revealed in the data, for all teachers to actively involve pupils in discussion aspects of a lesson by calling upon them if they were not volunteering. It should be pointed out that the data from teacher 6-2 deceptively support the proposition that she was actively involving as many pupils as possible in a discussion session. The large number of references to non-volunteers in teacher 6-2's social studies lesson was because her class was involved in a social studies quiz which took the form of a competition where pupils were asked questions in pre-determined order.

Teacher questioning behavior varied from lesson to lesson. Lower order questions, in the form of product and choice questions, tended to be more dominant than higher order questions (process and opinion) in language arts lessons, whereas, higher order questions designed to "get pupils to think" were more commonly associated with social studies lessons. However, relating teacher questioning behavior to subject area is an oversimplification of teacher behavior. When reference is made to the lesson vignettes in Appendix G it will be noted that the dominant mode of teacher presentation in the social studies lessons was through the discussion format. Where discussion was the principal mode of presentation in the language arts lessons, for example, in the lessons of teachers 1-3, 3-1 and 3-2, then it can be seen that higher order questions are more dominant than lower order

questions and appear to be related to the mode of lesson presentation.

There were distinct grade level variations in the use of higher and lower order questions, despite subject area or lesson presentation mode. Overall, first and third grade teachers used more higher order questions than did the sixth grade teachers, the exception in the sixth grade teachers being teacher 6-3 in her social studies lesson. Again, however, it should be pointed out that the high incidence of lower order (product) questions in teacher 6-2's social studies lesson was because the lesson consisted of a review of facts that took place in the form of a quiz.

SECTION E

Description of Stimulated Recall Interviews

As few studies have used stimulated recall methodology in naturalistic settings, one purpose of this study was to analyse "key" aspects of this methodology, focusing primarily upon interview procedures. As well as developing familiarization and technical strategies associated with filming (see Appendix D) this study modified in two ways the interviewing procedures used by Marland (1977). First of all, the interviewer took greater responsibility for selecting the stimulus points at which to stop the videotape, and secondly, greater use was made of probing questions in order to ascertain if teachers were consciously considering reasons for their behaviors. Therefore, the methodological data are presented in this section in order to answer the fifth research question stated in this study, that is, what are the strengths and weaknesses of stimulated recall when it is used as a research tool?

In accord with the exploratory nature of the study, various aspects of the procedures used in the stimulated recall interview situation have been presented in detail as a guide for other researchers using this methodology. The majority of this detail has been summarized in table format and expressed in percentages.

The length of interviews varied from one hour to two hours, with the length of the interview generally being related to the length of the stimulus lesson. That is, as the length of the lesson increased, so did the time spent during the interview session.

Overview of Interviewer and Respondent
Stimulated Recall Interview Behavior

The number of stimulus points ranged from 28 to 70. As Table 17 indicates, in the majority of stimulus lessons the interviewer initiated the selection of stimulus points more frequently than the respondents. One notable exception was teacher 3-2 in both her lessons and teacher 3-3 in her second lesson. The interviewer, while guided by his predetermined interview procedures, nevertheless adopted a flexible approach and took account of the idiosyncracies of each teacher in the interview situation. If the teacher was initiating the stopping of the videotape, and did so at a variety of interactive instructional acts, then the interviewer did not interfere. Such was the case with teacher 3-2, and as is indicated in Table 20 she did stop the tape at a wide variety of stimulus points which included a strong bias toward teacher task oriented questions and instructional tactics. The interviewer did however, monitor a tendency this teacher had to stop the tape where unacceptable pupil behavior was occurring.

Teacher 3-3 in her second lesson, dominated the selection of

Table 17

Overview of Interviewer and Respondent Stimulated Recall Interview Behavior

Teacher

Aspects of Verbal Behavior	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	Interview 1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	3
No. of Stimulus Points	32	31	38	45	47	33	51	58	70	45	43	28	46	31	48	43	47	35	30
% initiated by interviewer	65.6	74.2	50.0	44.4	55.3	57.6	47.1	34.5	18.6	24.4	51.2	17.9	69.6	70.9	54.2	81.4	36.2	45.7	60.0
% initiated by teacher	34.4	25.8	50.0	55.6	44.7	42.4	52.9	65.5	81.4	75.6	48.8	82.1	30.4	29.1	45.8	18.6	63.8	54.3	40.0
No. of Exchanges	180	137	229	212	230	184	235	188	237	154	183	151	252	156	172	200	179	137	133
% of exchanges spoken by teacher	52.8	52.6	52.0	53.3	51.7	51.6	54.5	60.1	58.6	59.7	55.7	58.3	52.0	51.3	52.3	49.0	55.9	54.7	53.4
% of exchanges spoken by interviewer	47.2	47.4	48.0	46.7	48.3	48.4	45.5	39.9	41.4	40.3	44.3	41.7	48.0	48.7	47.7	51.0	44.1	45.3	46.6
No. of exchanges per stimulus points	5.6	4.4	6.0	4.7	4.9	5.6	4.6	3.2	3.4	3.4	4.3	5.4	5.5	5.0	3.6	4.7	3.8	3.9	4.4

stimulus points. However, as was the case with teacher 3-2, a wide variety of interactive behaviors was focused on and the interviewer did not interfere with the "natural" flow of the interview.

Table 17 indicates that the respondents were responsible for slightly more exchanges spoken than the interviewer. However, interviewer exchanges were generally much shorter and were generally open-end initiatory, probing, confirming or clarifying questions. Table 18 suggests that both interviewer and respondents were cognizant of their roles during the interview situation. The data indicate, that in the majority of interviews, the interviewee spoke at least 72% of the lines of transcribed data. This indicated the willingness of the interviewees to verbalize their thoughts and the non-dominance of the interviewer in the interview situation.

Table 17 also indicates the number of exchanges spoken in relation to each stimulus point. The exchanges varied from 3.2 to 6.0 per stimulus stop. This frequency of exchanges occurred because of the probing, clarifying and confirming behavior of the interviewer.

Selection of Stimulus Points

The selection of stimulus points was a critical aspect of the design of the study. As was described in Chapter III, pilot research indicated that in order to explore teacher use of principles and beliefs, then the videotape should be stopped at a variety of inter-active points involving teacher instructional behavior. Tables 19 and 20 describe and categorize interviewer and respondent selection of stimulus points, while Table 21 summarizes the differences between interviewer and respondent selection of stimulus points.

Table 18

Lines Spoken by Interviewer and Respondent
during Stimulated Recall Interviews

Teacher	Lesson	No. Lines Spoken by Teacher	No. Lines Spoken by Interviewer	Line Total	% by Teacher	% by Interviewer
1-1	S/S	482	97	579	83.2	16.8
"	L/A	511	123	634	80.6	19.4
1-2	S/S	409	158	567	72.1	27.9
"	L/A	374	129	503	74.4	25.6
1-3	S/S	554	139	693	79.9	20.1
"	L/A	472	119	591	79.9	20.1
3-1	S/S	558	170	728	76.6	23.4
"	L/A	540	107	647	83.5	16.5
3-2	S/S	354	92	446	79.4	20.6
"	L/A	654	122	776	84.3	15.7
3-3	S/S	494	86	580	85.2	14.8
"	L/A	541	121	662	81.7	18.3
6-1	S/S	586	144	730	80.3	19.7
"	L/A	354	117	471	75.2	24.8
6-2	S/S	528	177	705	74.9	25.1
"	L/A	488	120	608	80.3	19.7
6-3	S/S	347	118	465	74.6	25.4
"	L/AP	250	85	335	74.6	25.4
"	L/AD	243	79	322	75.5	24.5

Table 19

Description and Categorization of Interviewer Selection of Stimulus Points

Categorization of Stimulus Points	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Lessons	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	3 %
N	21	23	19	20	26	19	24	20	13	11	22	5	32	22	26	35	17	15	18
Directions to Pupils	4.8	4.3	5.3	10.0	11.5	5.3	8.3	10.0					12.5	18.2	11.5	5.7		20.0	16.7
Teacher Initiated Questions	4.8	4.3	15.8	15.0	11.5	31.6	25.0	10.0	23.1	18.2	18.2	20.0	3.1		3.8	11.4	29.4		16.7
Pupil Response to Teacher Questions	17.4		15.8	10.0	3.8	15.8	8.3	5.0	23.1	18.2	4.5				3.8	11.4	11.8	6.7	11.1
Pupil Initiated Questions/ Behavior	14.3	17.4	21.1	10.0	3.8	10.5	4.2	10.0	7.7	18.2	13.6		21.9	18.2	7.7	2.9		6.7	
Teacher Giving Information		4.3	10.5	5.0	3.8	10.5	20.8	10.0		18.2	9.1	20.0	3.1	4.5	3.8	5.7	5.9	26.7	16.7
Instructional Tactics	23.8	21.7	21.1	20.0	19.2	15.8	12.5	40.0	23.1	18.2	41.0		6.3	31.8	23.0	34.3	23.5	20.0	22.2

Teacher

Table 19 (Continued)

Categorization of Stimulus Points	Teacher																				
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	3 %
Lessons N	21	23	19	20	26	19	24	20	13	11	22	5	32	22	26	35	17	15	18
Monitoring Pupil Progress	33.3	13.0		15.0	34.6	5.3	4.2	10.0	15.4		4.5	20.0	18.8	18.2	30.8	11.4	5.9	13.3	5.6
Organizational/ Managerial	9.5	8.7	5.3	5.0	7.7	5.3	12.5		7.7	9.1		20.0	12.5	4.5	11.5	5.7	11.8	6.7	5.6
Unacceptable Pupil Behavior	4.8	4.8	5.3	5.0	3.8		4.2	5.0			4.5	20.0	18.8	4.5	3.8	11.4	5.9		5.6
Other	4.8	4.3		5.0							4.5		3.1				5.9		
	100.1	100.2	100.2	100.0	99.7	100.1	100.0	100.0	100.1	100.1	99.9	100.0	100.1	99.9	99.7	99.9	100.1	100.1	100.2

Table 20

Description and Categorization of Teacher Selection of Stimulus Points

	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Categorization of Stimulus Points	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	3 %
N11	8		19	25	21	14	27	38	57	34	21	23	14	9	22	8	30	19	12
Directions to Pupils			10.5		4.5		3.7	10.5	3.5				21.4	11.1	13.7			15.8	
Teacher Initiated Questions	9.1	37.5			9.1	21.4	14.8	13.2	24.6	35.3	14.3	13.0	7.1		4.5	12.5	23.3		8.3
Pupil Response to Teacher Questions			15.8	8.0	4.5	7.1		5.3	10.5	14.7	4.8	13.0		11.1		12.5	10.0		
Pupil Initiated Questions/ Behavior		25.0	31.6	28.0	4.5	14.3	11.1	7.9	8.8	5.9	33.4	26.2	14.3	22.2	4.5		10.0		
Teacher Giving Information	9.1	12.5					25.9		8.8	14.7		17.4					6.7	5.3	8.3
Instructional Tactics		25.0	31.6	8.0	13.6	21.4	22.2	28.9	19.3	17.6	19.0	8.7	28.6	22.2	27.3	37.5	16.7	10.5	58.3

Table 20 (Continued)

	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Categorization of Stimulus Points	Lessons																		
	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	1 %	2 %	3 %
	N11	8	19	25	21	14	27	38	57	34	21	23	14	9	22	8	30	19	12
Monitoring Pupil Progress	18.2		5.3	20.0	45.5	28.6	7.4	21.1	3.5	5.9	9.5	8.7		33.3	45.5	12.5	30.0	57.9	16.7
Organizational/ Managerial	36.4			12.0	4.5								14.3		4.5		3.3	5.3	8.3
Unacceptable Pupil Behavior	27.3		5.3	20.0	13.6	7.1	7.4	13.2	21.0	5.9	19.0	13.0	14.3			12.5		5.3	
Other				4.0			7.4												
	100.1	100.0	100.1	100.0	99.8	99.9	99.9	100.1	100.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0	100.0	100.1	99.9

Table 21

Comparison Between Categories of Stimulus Points
Selected by Interviewer and Teacher

Categorization of Stimulus Points	Interviewer Selected		Teacher Selected		Totals	
	No.	%	No.	%	No.	%
Directions to pupils	31	8.0	21	5.1	52	6.5
Teacher initiated questions	49	12.6	60	14.6	109	13.6
Pupil responses to teacher questions/ directions	33	8.5	29	7.0	62	7.8
Pupil initiated questions/behavior	39	10.1	54	13.1	93	11.6
Teacher presenting information	34	8.8	27	6.6	61	7.6
Instructional tactics	95	24.5	84	20.4	179	22.4
Monitoring pupil progress	51	13.1	71	17.2	122	15.3
Organizational/ Managerial	29	7.5	16	3.9	45	5.6
Unacceptable pupil behavior	21	5.4	47	11.4	68	8.5
Other	6	1.5	3	0.7	9	1.1
Totals	388	100.0	412	100.0	800	100.0

Definition of Stimulus Point Categories

Tables 19 and 29 reveal that the stimulus points chosen by the interviewer and respondents could be placed into 10 broad categories. While many of the stimulus point categories described below fit under the broad umbrella of instruction, they have been specified in this format to give more discreteness to the actual points at which the videotape was stopped by both interviewer and teacher.

Directions to Pupils

This category refers to instructions to pupils that deal with such matters as completing a section of work, taking out some material or moving on to a new activity.

Teacher Initiated Questions

This category refers to teacher questions directed to individuals or the class as a whole. The questions can be of any cognitive level of complexity such as simple recall, convergent, divergent or evaluative.

Pupil Response to Teacher Questions

Pupil response to a teacher question can trigger off a variety of thoughts and emotions in the teacher. The response might indicate to the teacher the pupil's grasp of a concept and it might at the same time evoke emotions such as surprise, annoyance, pleasure or disappointment. Pupil response of course, generally dictates the next move to be made by the teacher.

Pupil Initiated Questions/Behavior

This category refers to questions, comments or contacts the

pupil initiates with the teacher that act to stimulate her thoughts.

Teacher Giving Information

Teacher giving information refers to when the teacher is presenting content information to the class or an individual. This can be through lecture format or through reading of a text or through chalkboard notes.

Instructional Tactics

This is a wide ranging category and refers to when the teacher is describing, explaining, demonstrating, comparing and using similar skills. The use of the chalkboard and audiovisual aids to assist with these procedures is also included in this category.

Monitoring Pupil Progress

This category refers to when the teacher is supervising the pupils at work whether she is stationary or is moving around the room checking their progress and assisting where necessary. This category also includes teacher activities such as listening to pupils read or recite. In this category the teacher gains feedback on pupil progress.

Organizational/Managerial

The organizational/managerial category refers to getting and setting up equipment, giving out materials, organizing class groups as well as any activity that deals with the larger context of general school administration.

Unacceptable Pupil Behavior

This category refers to matters such as student noise, control problems, inattention to task, lateness, incompletion of set work,

and rudeness. It should be noted that this category does not necessarily always refer to pupil control problems.

Other

The stimulus points in this category include variables that are often extraneous to the classroom and which set off "a chain of thoughts." For example, thoughts about past teaching experiences or the teacher's family.

Discussion of Selection of Stimulus Points

Discussion concerning selection of stimulus points will centre on the composite data presented in Tables 19, 20 and 21. However, at times reference will be made to an individual table.

Analysis of the data indicates that all categories were selected by the interviewer and respondent (teacher) in the majority of the lessons. Where a category is not referred to in Table 19 it is usually found in Table 20. Absence of a stimulus category or its lack of prominence can be accounted for by reference to two basic reasons. The emphasis on selection of instructional interactions meant that actions facilitative of instruction, such as managerial or control behaviors on the part of the teacher were considered of secondary importance, but nevertheless, were not to be entirely neglected. Secondly, the mode of presentation, the organization of the lesson and certain teacher instructional behaviors appeared infrequently in some lessons. These two sets of reasons are possible explanations of why organizational/managerial behavior as defined above did not occur in the second lesson taught by teacher 3-1 and the first lesson taught by teacher 3-3.

Table 21 compares the selection of stimulus points by the interviewer and the teachers. This table indicates that the videotape was predominantly stopped at interactive instructional situations by both interviewer and teachers, with instructional tactics, monitoring pupil progress and teacher initiated questions being the most favoured stimulus points.

Several trends concerning the stopping of the tape at various stimulus points can be discerned from Table 21. For example, teachers were more than twice as likely to stop the tape at unacceptable pupil behavior than was the interviewer, while the interviewer stopped the videotape at organizational/managerial moves almost twice as many times as the teachers.

For the purpose of this research project, it was appropriate that both interviewer and respondent control the stopping of the videotape, and furthermore, that the focus should be on the selection of stimulus points involving instructional tactics. The data indicate that both these tasks were carried out by interviewer and teacher, and that the teachers had learnt one aspect of their interviewee role during the interview situation.

Interviewer Verbal Behavior

The role of the interviewer has been fully described in Chapter III. To summarize, the interviewer's role was to facilitate the full disclosure of teacher interactive thoughts and emotions that occurred at each stimulus point at which the videotape was stopped. In doing so, the interviewer created a supportive climate which indicated he was interested in what the teacher had to say and was not

evaluative or directive in his statements or questioning.

The interviewer indicated his interest in the teacher and her pupils by use of <u>supportive statements</u> that were often in response to a teacher statement. For example, the interviewer responded as follows to teacher 3-1 in her language arts lesson:

T: I'd love to show you the story book that he wrote for the contest.

I: I'd love to see it.

T: It was excellent.

When teacher 3-3 indicated the weather had influenced the pupils' behaviors, the interviewer responded:

I: It was a hot day.

Teacher 6-1 toward the end of her interview commented:

T: . . . but I don't know what else I was thinking there. I can't seem to think of my thoughts there very much.

I: Well you've had a very busy day.

<u>Linking statements</u> at the end of segments, as well as providing a conversational flow to the interview situation, were also designed to enhance the interviewer's supportive role. For example:

I: Right, we'll move on.

I: We'll just skip forward a fraction and see what they do.

The categories of verbal behavior, incompatible with the interviewer's role, namely, <u>leading questions</u> such as:

I: What were you doing? Were you checking on your lesson plans there were you?

I: Why is it something that they're familiar with and something that's easier?

and <u>evaluative statements</u> such as:

I: That's a good pattern.

I: Oh that makes a lot of sense,

occurred infrequently or not at all in the majority of interviews.

Table 22 indicates that leading questions occurred only in three

interviews, and then comprised no more than 1.8% of the interviewer's

verbal behavior. Evaluative statements occurred infrequently and

accounted for no more than 1.3% of the interviewer's verbal behavior

in any one interview. The low incidence of leading questions and

evaluative statements is one indication that the interviewer was

consistently providing a supportive, non-evaluative direction in the

interview situation.

The majority of interviewer verbal behavior consisted of four

main types of questions:

1. Open-ended initiatory questions, for example:

I: Were you having any thoughts when you introduced the
book to the children?

I: Did you have any thoughts when you asked them to swap
papers and mark?

2. Probing questions.

I: How do you know she didn't understand?

I: And how did that make you feel?

I: And did you have any conscious thoughts or feelings
as you were probing during that time then?

3. Confirming questions.

I: So they're rules you've used before?

I: That was the time when you were conscious of his speed?

I: She was the first narrator was she?

4. Clarifying questions.

I: But you're not sure whether you were thinking that or
not?

Table 22

Interviewer Verbal Behavior

	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Sub-Categories of Interviewer Verbal Behavior	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	96	84	102	111	112	90	78	108	93	64	83	63	83	121	82	105	64	62	86
Open-ended Initiatory Questions	24.0	29.8	20.6	16.2	18.8	17.8	20.5	22.2	10.8	17.2	24.1	6.3	22.9	24.0	29.3	31.4	21.9	24.2	16.3
Probing Questions	39.6	32.1	40.2	35.1	25.0	25.6	33.3	38.9	41.9	42.2	39.8	47.6	26.5	34.7	25.6	30.5	37.5	38.7	36.0
Confirming Questions	13.5	7.1	13.7	14.4	16.0	17.8	18.0	12.0	19.4	14.1	4.8	7.9	10.8	5.8	8.5	11.4	9.4	12.9	9.3
Clarifying Questions	6.3	4.8	2.0	6.3	6.2	5.6	7.7	2.8	5.4	1.6	7.2	15.9	3.6	7.4	8.5	4.8	6.3	11.3	9.3
Leading Questions	1.0	1.2		1.8															
Supportive Statements	3.1	6.0	5.9	7.2	9.8	6.7	6.4	4.6	7.5	4.7	6.0	9.5	4.8	4.1	6.1	4.8	4.3	3.2	5.8
Evaluative Statements	1.0		1.0		0.9	1.1	1.3	0.9	1.1				1.2	0.8					
Linking Statements	2.1	2.4	2.9	2.7	1.8	1.1	3.8	4.6	2.2		4.8	3.2	12.0	6.6	8.5	2.8			8.1
Neutral Comments	6.3	10.7	4.9	5.4	8.0	7.8	2.6	0.9	4.3	7.8	1.2	1.6	4.8	2.5	7.3	5.7	10.9	4.8	7.0

Table 22 (Continued)

Sub-Categories of Interviewer Verbal Behavior	Teacher																		
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/A %	S/S %	L/AD %	L/AP %	S/S %
N	96	84	102	111	112	90	78	108	93	64	83	63	83	121	82	105	64	62	86
Asides		1.2	1.0	1.8	0.9	2.2		0.9		3.1				1.7	1.2		1.6	1.6	1.2
Interviewer Directions	1.0				0.9						1.2					1.9	1.6	1.6	3.5
Restatement of Teacher Remark/Question		1.2		1.8	1.8	3.3			3.2		3.6	4.8	1.2	0.8					
Answer to Teacher Question/Remark	2.1	3.6	6.9	6.3	8.0	7.8	5.1	8.3	1.1	9.4	6.0		6.0	9.9	3.7	4.8	1.6	1.6	2.3
Non-Evaluative Description of Aspect of Lesson			1.0	0.9	1.8	3.3	1.3	3.7	3.2		1.2	3.2	6.0	1.7	1.2	1.9	4.7	1.6	1.2
	100.0	100.1	100.1	99.9	99.9	100.1	100.0	99.8	100.1	100.1	99.9	100.0	99.8	100.0	99.9	100.0	99.8	99.9	100.0

I: So you weren't quite certain whether it was or not?

I: By right out of hand, you mean what might happen?

The questioning behavior of the interviewer accounted for a minimum of 64% of his behavior in all stimulated recall interviews and indicated that he was consistently fulfilling his role in assisting all teachers to recall their thoughts associated with each stimulus point in the lesson.

Teacher Non-Recall of Interactive Thoughts

Part of the teacher's interview role was to indicate when she could not recall her thoughts wholly or partly, at any stimulus point. Table 23 indicates that seven of the nine teachers revealed they could not recall their thoughts at particular instances throughout the stimulus lesson.

The instances where teachers could not recall thoughts tended to cluster around three areas. First of all, when the teacher was not directly interacting with a pupil or the class, but instead was observing or supervising. For example, during teacher 6-1's social studies lesson:

    I: Any thoughts there as you were walking down the aisle
        and picking up that paper?

    I: No, I can't think of any right now. Probably were, but I
        can't think,

and in teacher 6-3's social studies lesson when she was waiting for the pupils to take out their books:

    I: Any particular thoughts as you were waiting there?

    T: I can't remember any.

The second area where teachers on occasions failed to recall

Table 23

Teacher Non-Recall of Interactive Thoughts

	Teacher																			
	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3				
	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/AD	L/AP	S/S
Occurrences of Non-Recall of Thoughts	3	1	-	-	-	-	-	1	3	-	1	1	-	4	2	-	-	-	-	-	3

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their thoughts involved the interviewer following a teacher statement
with a probing question. For example, in teacher 1-1's social studies
lesson:

> I: When did you consciously decide not to go on with the
> experience chart?
>
> T: I don't know. It could have been earlier.

This lack of recall in response to an interviewer probing
question also occurred in teacher 3-2's language arts lesson:

> T: . . . maybe I'm not being fair, I don't know, I often
> wonder that.
>
> I: Did you wonder that during the lesson or not?
>
> T: Probably, occasionally because it's always with me when
> we're having group discussions. At that point I wouldn't
> know, not too sure.

When the teacher expressed doubt about recalling her thoughts,
such as in the above instance, then they were disregarded for coding
purposes.

The third area where teachers could not recall their thoughts
related to the point in the interview when the stimulus point was
shown. Three teachers near the end of the interview situation could
not recall thoughts concerning a particular stimulus point. For
example, in teacher 6-2's language arts lesson:

> I: Can you remember what that was about?
>
> T: No I can't. Something on that page that I had assigned.
> I can't remember specifically what it was, these girls
> had some questions too,

and in teacher 6-3's social studies lesson,

> I: Were you having any thoughts when you drew that sort of
> comparison then about trading?
>
> T: I really can't remember then at this point. I sure must
> have but I can't recall it.

<u>Teacher Reference to Future Overt</u>
<u>Events in the Lesson</u>

An interesting phenomenon common to all teachers' verbal inter-
viewer behavior was a reference to future overt happenings in the
lesson. These references generally occurred in probing sections of
the interview. They have been categorized in Table 24 and reveal that
references occurred on between one and eight occasions for each
teacher.

As a check on teachers' recall of overt events, all instances
were checked against the videotapes of the lessons and no instance was
found where the teacher's reference to a future event was incorrectly
indicated. This result is in accord with a similar check carried out
by Marland (1977) in his study where it was found that only on two
occasions were references to future happenings in the lessons found
to be incorrect.

Some examples of this type of behavior without contextual
elaboration are:

T 1-3: Later on you'll find that when I'm talking about
different types of animals, where they haven't had
experience with them, they're more willing to sit
back and wait a little bit rather than speak out.

T 3-1: What I was getting at in the next part that is coming
up is how do we start a story.

T 3-1: So that's why, later on, he just said a bird, and later
on I called it a nightingale which was quite
unconscious.

T 3-2: Later in the lesson when they were doing a written
assignment, they started using chronically the words
good, bad, happy, sad.

T 3-3: . . . I remember thinking all these fantastic things
I'm going to tell them, thinking what to ask them which
I did ask them, "Do you believe this?"

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Table 24

Teacher Reference to Future Overt Events in the Lesson

	1-1		1-2		1-3		3-1		3-2		3-3		6-1		6-2		6-3		
Teacher	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/A	S/S	L/AD	L/AP	S/S
References to Future Events	1	-	1	-	1	3	4	3	4	4	4	7	8	8	1	3	2	2	5

Interviewer verbal behavior also occasionally referred to future happenings in the lesson. This behavior occurred during probing sections of the interview when the interviewer was using questions to clarify an uncertain point. Of the 14 future instances referred to in teacher responses, only one indicated inaccurate recall when the instances were checked with the videotapes of the lessons. Some examples of clarifying questions that referred to future lesson happenings are:

        I: I can't remember now did someone go and get her?

        T 1-1: I went.

and

        I: I can't remember now, did you do anything if you
             found beginnings . . . not very clear?

        T 3-1: Yes I did. I pointed out for instance to X that a
                word should perhaps have a capital letter.

Chapter VI

SUMMARY AND DISCUSSION OF RESULTS

The purpose of this chapter is to synthesize the results of
the study presented in Chapter V and relate them specifically to the
research problems stated in this project.

Five major problems have guided the investigations and data
analysis in this study. They are as follows:

1. What categories of beliefs, principles, rules and other
    factors influence teachers' behavior during the inter-
    active phase of teaching?

2. When and how do teachers make use of beliefs, principles,
    rules and other factors during the interactive phase of
    teaching?

3. What is the content of the information teachers process
    during the interactive phase of teaching?

4. Does grade level, subject area or lesson mode influence
    the content and style of teachers' information processing?

5. What are the strengths and weaknesses of stimulated recall
    methodology when it is used as a research tool?

The discussion in this chapter will primarily focus on the
nine teachers as a group. Table 6 which presents the distribution of
teacher thoughts over all categories indicates that while there are
differences in the style and content of the teachers' information
processing, there is, nevertheless, sufficient commonality to

support treating the nine teachers as a group. Only when the research
problems demand it will the discussion focus on different grade
levels, specific teachers, subject areas or differing modes of lesson
presentation.

The five problem questions will not be discussed separately in
the order listed. Because of the close links between Questions 1 and
2, they will be discussed together and then Questions 3, 4 and 5 will
be discussed in that order.

Questions 1 and 2

Questions 1 and 2 deal with the categories of beliefs,
principles, rules and other factors that guide or influence teachers'
behavior, and when and how teacher behavior is influenced.

The factors influencing teacher behavior are outlined in
Figure 2.

Principles

The data indicate that there are three categories of principles
that guide teachers' behavior during the interactive phase of teaching.
These principles have been classified as:

1. Overarching principles.

2. General pedagogical principles.

3. Principles from learning theory, motivational theory and
   human growth and development.

While the categories of principles are discussed separately,
it needs to be pointed out that the various principles do not
discretely influence a teacher's behavior. Principles interact with
others in the same classification, with principles in other

Figure 2

Factors Influencing Teacher Behavior

A. Principles

    1. Overarching

    2. General pedagogical

    3. Psychological

B. Beliefs

C. Classroom Rules   ⟶ Teacher Behavior

D. Other Factors

    1. Teacher's role conceptions

    2. Idiosyncratic intrusions

    3. Ecological influences

    4. Objectives

    5. Information concerning pupils
       and expectations of pupils

classifications and with a variety of beliefs and other factors in order to influence or guide the teacher's behavior.

Overarching Principles

Overarching principles were revealed through macro-analysis of the stimulated recall transcripts. These principles appear to exert a pervasive influence on a teacher's classroom behavior and as such, are related to the teacher's style of behavior in the classroom. They are shaped by a teacher's role conception and its influences on the pupils. Three overarching principles are reported in this study, the principle of teacher authenticity, the principle of suppressing emotions and the principle of teacher self-monitoring.

The Principle of Teacher Authenticity. This principle was exhibited by all nine teachers and is a dimension of the teacher's role conception that presents the teacher as an approachable person who makes mistakes, "does not know everything" and does things that other adults do. The use of this principle appeared to be spontaneous as pre-lesson interviews did not contain references to behavior associated with it. The use of the principle did not appear in every lesson, was invoked when needed and when it was used, there was no obvious pattern associated with its use. The principle was used to establish the teacher as a person who was approachable and whom the pupils could have faith in and trust. At times the principle was used to relax the atmosphere in the classroom or promote pupil self-concept. The teachers did this by relating personal incidents or deliberately making errors in front of the class.

The Principle of Suppressing Emotions. This principle, as described by Marland (1977), was used by all nine teachers in the study.

The principle involved the teachers in hiding their emotions from the class or individual pupils. This principle was invoked to preserve pupil self-concept, and was operationalized when the teachers contained their emotions and refrained from severely chastising pupils. This principle was also used as a management strategy and involved the teachers maintaining a deliberate and controlled silence in order to gain the attention of the class.

This principle was not always adhered to. On occasions the teachers could not contain their emotions and on other occasions teachers deliberately violated the principle in order to use the influence of their show of emotions as an "ultimate management strategy."

The Principle of Teacher Self-Monitoring. All nine teachers made use of this principle in the 19 lessons videotaped. The principle reveals that the teacher is at times aware of the influence of her behavior on the pupils or is aware that she is influencing pupils but is not always certain of pupil perceptions of her behavior. There were 226 instances in the self-awareness category of the micro-analysis that indicated teachers were evaluating their own performances and analysing the effects of their behavior upon the pupils. The teachers in this study monitored their behavior throughout all aspects of all lessons. The majority of the thoughts indicating self-monitoring behavior revealed that the teachers were critically assessing their classroom behaviors.

General Pedagogical Principles

These are teaching principles with psychological bases that

are broader than specific psychological principles such as motivation or reinforcement. These principles were revealed during the macro-analysis of the transcripts. Five general pedagogical principles were distinguished in the transcripts and included the principles of cognitive linking, integration, general involvement, equality of treatment and closure.

The Principle of Cognitive Linking. This principle was used by all teachers in the study and involved them in relating new know-ledge with what pupils already possessed, or interrelating relevant aspects of some subject matter already familiar to pupils. The teachers considered that cognitive linking placed a lesson in context, helped make it meaningful for the pupils and acted as a motivational strategy. Cognitive linking was used in two phases of the lessons by the teachers. First of all, it was used in the introductory section of the lesson for the reasons stated above, and secondly, it was used in phases of the lesson that involved review. When reviewing past work, efforts were made by the teachers to link past work with work presently being dealt with.

The Principle of Integration. Use of this principle was reported in the transcripts of all teachers and refers to when a teacher crosses subject area boundaries and uses the lesson content under discussion to practise skills and concepts that would normally be dealt with in another subject area. The principle appears to be based on concepts of transfer of training that involve stimulus generalization.

The use of this principle was at times deliberately planned, at other times it appeared to be part of a teacher's internalized

instructional style, while at other times it appeared to occur quite spontaneously and was used to give relevance to the teaching of some skill or concept.

The Principle of General Involvement. This principle was invoked by all teachers in the study and refers to the teacher's desire to involve pupils in the lesson to develop some aspects of their personality, to socialize them into the classroom scene or to minimize the influence of the teacher's role, especially in discussion sessions.

Teachers in this study attributed certain personality characteristics to certain pupils and made efforts to alter the pupils' behaviors if they considered the personality characteristic undesirable.

Shy or withdrawn pupils were involved in discussion sessions to give them opportunities to speak in public and develop their communicative skills and self-confidence.

This principle has a basic affective component and is not to be confused with the principle stressed within S-R learning theory which emphasizes the active involvement of the learners in a task.

The Principle of Equality of Treatment. This principle was used by teachers in group situations as well as in dyadic contacts. The principle involved the teachers in attempting to treat all pupils equally and consistently. This principle appears to be based upon psychological principles of motivation and self-concept maintenance-enhancement. It was considered that if pupils were not treated equally then they would not be motivated to participate in the lesson and they would feel "badly," "disappointed" and "let down" if they were not given the opportunity to contribute to a discussion.

On some occasions when this principle could not be observed, some teachers experienced emotional discomfort and made efforts to compensate pupils who had not participated, by calling upon them later in the lesson.

This principle was also invoked by teacher 6-2 when she punished children. This teacher made no distinction between conscientious and non-conscientious pupils when pupils were being punished.

The Principle of Closure. The use of this principle involves the teacher in reviewing, summarizing and evaluating "key" points so that the main facts, skills or concepts covered in a lesson are recalled. This principle was normally used at the conclusion of the lesson, but was used on one occasion during the course of the lesson.

The use of the principle involves discussion between teacher and pupils and relies heavily upon the learning principle of repetition. The pupils' responses in this summary and review period were also a means by which teachers evaluated the success of the lesson. Only five instances of closure were revealed in the transcripts, including two by teacher 1-2.

Principles from Learning Theory, Motivation Theory and Human Growth and Development

Specific Learning Principles. Teacher behavior indicating use of principles in this category was found in the Instructional Moves Category in the micro-content analysis. Analysis of instructional moves revealed that teachers were using a wide variety of psychological principles from learning and motivation theory. Six of the principles given prominence by the teachers involved in this study are mentioned

by all of the writers whose lists of important principles influencing learning are included in Table 1. These principles are repetition, reinforcement, motivation, pupil feedback, active pupil involvement in the learning process and transfer of learning.

The principle of repetition was used by all teachers in this study. Its use was indicated in 18 of the 19 stimulus lessons video-taped. The teachers in this study used repetition when drilling a fact or concept or when giving pupils instructions.

Reinforcement was used by seven of the nine teachers in 13 of the 19 lessons videotaped. The teachers in this study used positive reinforcement by rewarding pupils verbally with praise, or on occasions using physical contact such as a hug. The low inference process data summarized in Table 16 not only supports the teachers' reported use of reinforcement, but also indicates that the stimulated recall data has underscored the use of reinforcement by the teachers in this study. Reinforcement is considered synonymous with the concept "praise" used in the low inference data. Praise is described in the Brophy-Good Teacher-Pupil Dyadic Classroom Observation System as teacher evaluative reaction which goes beyond the level of simple affirmation, acceptance or positive feedback and includes the teacher verbally complimenting the pupil ("Good," "Wonderful") and/or by accompanying verbalization of positive feedback with expressions or gestures that indicate excitement or warmth. This can be regarded as a conservative indicator of reinforcement. Table 16 reveals that praise was used by all teachers in all lessons whereas Table 7 indicates no occurrences of reinforcement reported by teacher 6-3 in any of her three lessons and teachers 1-2, 3-3 and 6-2 in only one of

their lessons. One factor that could account for these variations in coding reinforcement could be the fact that the stimulated recall thoughts were samples of thoughts taken throughout a lesson whereas the low inference data attempted to code all teacher verbalizations.

Motivation was used by the teachers in 16 of the 19 lessons and took a variety of forms. The teachers attempted to use known interests of pupils, artifacts, competition, the behavior of other children and their own behavior as models. It was used with individuals as well as the whole class and was used throughout various phases of the lessons. One distinguishing pattern associated with the use of motivation is that the three sixth grade teachers emphasized extrinsic motivation, while the three first grade teachers emphasized intrinsic motivation. Of the third grade teachers, 3-1 and 3-3 placed more emphasis on intrinsic rather than extrinsic motivation, while the reverse was true for teacher 3-2.

Feedback--pupil was referred to by eight of the nine teachers in 12 of the 19 lessons. Teachers gave feedback in both verbal and written forms, with verbal feedback being the most prominant, especially for first and third grades. Feedback was given to pupils throughout all phases of a lesson. Again, the low inference process data in Table 16 confirms teacher use of feedback to pupils. The combined low inference categories of answer affirmed/accepted by the teacher are considered synonymous with the stimulated recall sub-category of feedback--pupil. Table 16 indicates that all teachers gave feedback to pupils in all lessons. The feedback was given in the form of teacher affirmation/acceptance or criticism of pupil responses to teacher questions.

Actively involving pupils in the learning process was considered by eight of the nine teachers in 11 of the 19 lessons. The teachers desired pupils to become involved for a variety of reasons. They considered that pupils "learned by doing," and that if involved they would be attending to the lesson and therefore learning. The use of this principle was considered just as important by the sixth grade teachers as by the first and third grade teachers. The sixth grade teachers stressed that a teacher should avoid "talking too much" because "pupils switch off." Therefore, these teachers saw the need, as did the other six teachers in the study, to actively involve their pupils in a variety of experiences that stressed "doing" rather than listening.

Transfer of learning is the final principle in this section that was included in Table 1 by all seven authors. An awareness of transfer of learning was indicated by six of the nine teachers in 11 of the 19 lessons. While the teachers did not mention the term, they were primarily aware of the concept of stimulus generalization. There was no distinctive pattern associated with teacher use of transfer of learning.

Major Learning Processes. The teachers in this study were eclectic in their use and understanding of a variety of ways in which pupils learn. Eight of the nine teachers in 14 of the 19 lessons, indicated that their instructional thoughts were centred on learning processes. The learning processes included learning through problem solving, through association and discrimination, and through the teacher using a variety of modes of presentation (variation in presentation of stimuli).

The three first grade teachers, especially in their social studies lessons, invoked the principle of problem solving more than the third and sixth grade teachers, with the exception of teacher 6-3 in her social studies lesson. The three first grade teachers used convergent and divergent questions in order to pose problems for their pupils. The promotion of learning through problem solving was consistent with a general objective expressed by the first grade teachers, which was "to promote independent pupil thinking."

Miscellaneous Psychological Principles. Teachers considered a variety of psychological principles that for convenience were grouped together under the title of "miscellaneous." The teachers' thoughts indicated they were consciously maintaining-enhancing student self-concept, class atmosphere, and were catering for individual differences. Table 7 reveals that teacher 6-2 in her social studies lesson placed more emphasis on self-concept maintenance-enhancement than did any teacher in any other lesson. Teacher 6-2 revealed the emphasis given to this principle was to counteract any threatening influences a competitive game situation might have on certain pupils.

Developmental Principles. Analysis of teachers' thoughts during instruction indicated they rarely processed specific principles or concepts that were associated with the psychology of human growth and development.

Some general references were made to aspects of child development in the beliefs category of the micro-analysis and in the category dealing with information--pupil. However, teachers did reveal in the non-interactive data, some recognition of pupil stages of development in the cognitive, affective and psycho-motor domains.

Beliefs

This study has concentrated upon beliefs revealed in the inter-
active thoughts of teachers that guided their behavior during
instruction. While beliefs concerning pupil behavior and learning
also occurred in the non-interactive data, these were not a focus of
the study and have not been analysed.

Table 6 indicates the percentage distribution of teacher
beliefs revealed in the micro-analysis ranged between 1.9% and 7.7%
of the nine teachers' thoughts in this study. The number of beliefs
cited in Table 12 ranged from a low of five in both of teacher 3-3's
lessons to a high of 24 in teacher 6-2's social studies lesson. The
average number of beliefs per teacher cited in each lesson was 13.

The beliefs were couched in non-technical language and were
classified into six major areas in the micro-content analysis. These
six areas referred to general pedagogical beliefs, developmental
beliefs, general learning beliefs, beliefs concerning specific
learning principles, beliefs concerning memory and beliefs relating to
general psychological principles.

The beliefs revealed in these six categories were generally
found in association with a teacher's thoughts about instructional
moves and were often given as the supporting reasons for the use of
the instructional moves. It should be noted, that the psychological
beliefs revealed in the micro-analysis, explicitly, and in some cases
implicitly, supported the use of overarching principles, general
pedagogical principles and psychological principles discussed earlier
in this chapter.

Teacher beliefs and principles were closely linked in this study with teacher use of principles representing the practical expression of their beliefs concerning teaching and learning.

General Pedagogical Beliefs

Beliefs in this category were expressed by all teachers in all the stimulus lessons. These beliefs were concerned with the general role of the teacher, the role of the teacher in specific teaching-learning situations and general beliefs about pupils.

Beliefs concerning the general role of the teacher indicated that the teacher should be supportive and approachable, should treat all pupils equally and that an absolutely quiet classroom was undesirable.

All teachers expressed beliefs that guided their behaviors in specific teaching-learning situations. Specific beliefs cited generally focused on two main areas, how teachers should conduct discussion sessions and secondly, how they should manage small group activities. In discussion sessions it was believed that the teacher should not over-dominate, should involve all those who wanted to participate, should encourage "shy" children to participate and should not have to respond to all pupils' comments.

When managing small group activities, the teachers believed that when the group was working harmoniously, it was preferable to ignore small errors in the work activity than to disrupt the flow of the group interaction and also, that pupils should be disciplined quietly and unobtrusively to avoid disrupting the attention of the rest of the group.

General beliefs concerning the behavior of children were expressed by all teachers and generally focused on the belief that some pupil behavior was governed by the pupils' knowledge of and expectations for the teacher's behavior.

Developmental Beliefs

All teachers except teachers 3-3 and 6-3 stated beliefs categorized as developmental. These beliefs were expressed in general terms and referred to behavior considered appropriate for, or typical of a certain age group. The beliefs generally focused on two areas, namely, how a pupil's stage of development influenced the learning process or the pupil's general behavior. Beliefs were concerned with the short attention span of elementary school children, their ego-centredness and their tendency to have "black and white" attitudes.

Few references were made in this study to pupil readiness for learning or stages of cognitive development. Even fewer references were made to pupil psychomotor development.

The fact that teachers did not express beliefs in the importance of pupil developmental stages as determinants of their instructional behavior, does not necessarily suggest teachers were unaware of concepts and principles from developmental psychology. Perhaps as Jackson (1968) and Good and Brophy (1973) suggest, the fast pace of classroom life could be one of the many reasons why teacher interactive thoughts did not reveal information in this area. It appears that procedures such as indepth interviews are required to investigate teacher knowledge of concepts and principles from developmental psychology.

General Beliefs Concerning Learning

The nine teachers in the study revealed beliefs concerning their conceptions of how learning best took place. These teachers were eclectic in their beliefs and considered learning was promoted through repetition, problem solving and the pupil's active involvement in the learning process. It was also believed that learning should be meaningful, should involve pupils with concrete experiences and should involve the pupils being exposed to a variety of stimuli.

Beliefs Concerning Specific Learning Principles

Beliefs were expressed concerning the importance of specific principles such as reinforcement, motivation, transfer of learning and self-concept maintenance-enhancement. Beliefs in the use of these principles were expressed by at least five teachers on at least one occasion in their lessons. Expressions of belief in these principles generally occurred with the use of the principle and were not confined to any distinct phase of the lesson. The reference to a belief in a principle often occurred when a spontaneous need arose to invoke use of the principle. For example, when teacher 6-2 gave a pupil an "easy" question to answer in a social studies group competition, she was considering self-concept and stated, "Well to this point because he hadn't answered too many of them correctly . . . [and] it will give him a little bit of good feeling and personal satisfaction."

The spontaneous or unplanned use of psychological principles, and the fact that teachers articulated beliefs that supported the use of these principles, suggest that the use of the principles had become internalized elements in the teachers' behavior repertoires.

Beliefs Concerning Memory

Beliefs concerning memory were expressed by six of the nine teachers. The most common belief expressed (by four of the six teachers) concerned the use of associated cues with material to be remembered. These cues were used with material the teachers considered the pupils would have difficulty remembering. It was believed that the use of the cue would assist with recall of the fact or concept.

Beliefs Concerning General Psychological Principles

Few beliefs were recorded in this sub-category. The isolated beliefs referred to included a belief in the importance of fostering individual differences and beliefs that the social development and personality development of "shy" children could be enhanced by involving them in group discussion. It is interesting to note, that while only teachers 1-3 and 6-3 expressed a belief in the need to cater for individual differences, all teachers did recognize and cater for differing pupil personality characteristics. However, except for the three first grade teachers, few efforts were made to cater for differing academic potential and achievement levels of the pupils.

Awareness of the need to cater for individual differences was referred to by all teachers in the non-interactive data where their comments suggest that behavior in this area was part of their internalized teaching style.

The variety of educational psychology principles used in this study and the beliefs expressed in their importance is contrary to the findings of Jackson (1968) and Goodlad, Klein and others (1974) and suggest that the teachers, in this study at least, had consciously

incorporated these principles into their repertoires of teaching behaviors. The variety of principles used in a large number of contexts tend to support the contention of Elkind (1976) concerning the "multi-faceted" nature of learning in the classroom and the complexity of human learning.

<u>Classroom Rules</u>

Findings concerning the use of classroom rules were revealed in the content category of information--other. Marland (1977) indicated that teacher thoughts contained few references to teacher use of classroom rules. This study also suggests that classroom rules are not a major factor in determining the teacher's behavior in the classroom.

The classroom rules reported by the teachers in this study referred to organizational features of classroom life that controlled such matters as pupil movement around the room or the time allowed for the completion of homework. Rules operated to provide part of the supporting structure that contributed to the even flow of classroom life. When rules were broken, the pupils were reminded of the rule and in most cases punished. For example, when two pupils in teacher 6-2's social studies lesson handed in work to be corrected without including their names on the work, they were each required to write out their name 100 times.

<u>Other Factors Influencing Teacher Behavior During
the Interactive Phase of Teaching</u>

As well as investigating what principles, beliefs and rules influenced teachers' behaviors during the interactive phase of

teaching, this study also investigated if the mental lives of teachers revealed other major factors that influenced their behaviors during the interactive phase of teaching.

Beside beliefs, principles and rules, three other related factors were revealed as influencing teacher interactive behavior in the classroom. These factors were concerned with the teacher's role conception, the influence of idiosyncratic intrusions and ecological variables upon teacher behavior.

Teacher's Role Conception

The transcripts revealed thoughts indicating that all teachers held clear conceptions concerning how their role as a teacher should be played in the classroom. These role conceptions helped shape the way teachers interacted with pupils and explained part of the teacher's interactive behavior. There was no total role conception common to all teachers and it should be stressed that thoughts revealing how a teacher conceived of her role were gained from only two lessons. Obviously, not all aspects of a teacher's role were revealed during the two stimulus lessons, only those considered important by the teachers during those portions of the lessons discussed in the stimulated recall interviews. For example, teacher 3-1 during discussion sessions in both her lessons encouraged interaction between pupils to avoid dominating and directing the discussion, while teacher 6-2 avoided a lengthy discussion with pupils concerning the use of "good manners" because she believed it was not completely the teacher's responsibility "to see that these kids are brought up properly."

Three of the teachers indicated in their thoughts that the teacher did not have to do all the teaching in the classroom and that

the use of peer tutors could play an important role in the teaching-learning process. The teachers used peer tutors when they were occupied with a pupil and could not assist others, and to help explain concepts when they had not been successful themselves.

An aspect of the teacher's role that was common to six of the nine teachers concerned student involvement in decision making. The involvement in decision making was related to a number of areas. For example, pupils were permitted to select their own basic reading texts, composition topics, free reading texts, the order in which they could complete a set of tasks and the actors they would include in a class play. When the whole class was involved in decision making a majority vote was used to make the decision.

Several assumptions appeared to support teacher involvement of pupils in decision making. It was considered that student involvement would provide motivation, assist the development of "independent thinkers" and teach pupils to accept responsibility for decision making.

How a teacher conceives of her role in the classroom is manifested in a variety of ways. While discussed separately in the earlier section of overarching principles, it should be noted that the principles of teacher authenticity and suppressing emotions also form part of a teacher's total role conception.

Idiosyncratic Intrusion

This variable was revealed by five teachers in the study and referred to the fact that a teacher exhibited a strongly held belief, value or personality characteristic that was activated by a stimulus

to intrude into the planned course of the lesson to relieve a tension
or pressure the teacher was experiencing. The idiosyncratic intrusion
influenced the teacher in stopping the lesson and lecturing pupils,
in changing the course of the lesson to avoid such concepts as "death"
or to physically remove themselves from pupils when claustrophobic
feelings were being experienced.

The fact that six out of the nine teachers revealed idio-
syncratic intrusions suggests that it may be worthwhile to investigate
if this phenomena is common to teachers as a whole, what forms it takes
and the influence of excessive intrusions upon teacher performance and
pupil behavior. Henry (1963) has also noted the influence of a
similar variable which he has called "idiosyncratic cultural pre-
occupations." He pointed out that these preoccupations were exhibited
by teachers during spelling drill or competitions when they placed
words in a sentence to make them clear. Henry pointed out that there
was often no relevance between the word being drilled and the object
of the sentence and that the teacher was establishing irrelevance
between words and associations. In doing so, the teacher revealed
aspects of her belief system.

Ecological Influences

The macro-analysis in this study identified nine ecological
variables that were consciously referred to in the teachers' inter-
active thoughts. These variables were classified as temporal, spatial,
class props, group size, grade level, class ability, organizational,
administrative/managerial and climatic. These ecological or contextual
variables influenced the behaviors of all teachers in all lessons by

guiding the course of instruction and at times mediating the influence
of teacher beliefs and principles. Each variable is now briefly
discussed, and its influence upon teacher behavior is indicated.

The temporal variable influenced all teachers with the possible
exception of teacher 3-3. The time of the school year, the time of
the day and the time demands of class timetables all had circum-
scribing effects upon teacher instructional behavior. The end of the
year was given as a reason by the sixth grade teachers when they
tended to overlook some academic as well as affective behavior they
claimed would not have been countenanced earlier in the year. These
teachers maintained they had achieved as much as they could with their
pupils and that extra efforts near the end of the school year were not
justified if they had not so far succeeded in changing the pupils'
behaviors.

The need to complete a planned lesson before a recess break
or meet timetabling commitments with other teachers caused eight of
the nine teachers to consciously monitor time and adapt their teaching
strategies, or change their instructional plans. Examples of these
variations included placing spelling words on the chalkboard instead
of having pupils sound them out as was normally the case, the teacher
giving out materials because she could "do it quicker" than the pupils,
and the shortening of planned discussion sessions. The need to shorten
discussion sections of a lesson distressed a number of teachers,
especially teachers 1-1 and 3-2. This was because time mediated the
operation of principles of general involvement and equality of treat-
ment which were strongly held by these two teachers. These teachers
made efforts to include in later discussion sessions those pupils they

considered had been treated unequally or who they had not been able to involve in the discussion.

The spatial variable influenced those teachers who worked in open areas. Three of the four teachers who reported the influence of this variable indicated they monitored classroom noise more than would normally be the case, had to alter their teaching styles and not be as exuberant as they would prefer to be, had to schedule discussion sessions so as not to disturb other classes and had to develop strategies (for example, motivational "small talk" comprising jokes) in lessons involving oral work so the pupils would not have their attention distracted by the activities of nearby classes.

Class props which included permanent displays and various types of equipment in the classroom, had both positive and negative influences upon the teachers' behaviors. Props in the nature of arti-facts or displays were at times deliberately used by teachers to assist with motivation and at other times were spontaneously used to assist the flow of the lesson. On the other hand, the loss or malfunction of props, for example, the breakdown of a record player, caused delays in the lesson which often resulted in frustration and inconvenience for both teacher and pupils.

Grade level, the "general ability" level of a class, and group size influenced the ways in which teachers interacted with their pupils. Teachers associated certain behaviors with a grade level, for example, teacher 3-1 maintained that third grade pupils could not follow instructions very well and that instructions had to be continually repeated. The low reading achievement of part of her class influenced teacher 6-3 not to criticize these children because she did

not want to harm their self-concepts. Just as grade level and a class's ability influenced teacher instructional behavior, so did group size. For example, it was revealed by two teachers that group size negatively influenced their efforts to individualize instruction. Teacher 6-1, who had the largest class in this study, altered her instructional strategies in sessions that involved correcting work or discussion so that she could invoke the principle of equality of treatment. So that all pupils would have a chance to give an answer or participate in the discussion, this teacher chose pupils in turn from their rows of seats.

The organizational sub-variable refers to grouping patterns within the classroom that may be relatively permanent or arranged for short term purposes. Teacher 6-2 illustrated the influence of this variable upon her behavior when she formed groups for a specific task, found that some groups finished earlier than other groups and then had to devise extra tasks for these groups. This teacher decided to re-structure the groups when the particular task was to be practised on another day.

The sub-variable classified as administrative/managerial contained two facets that influenced a teacher's behavior. The first facet refers to general school administrative styles that intruded into the classroom such as intercom announcements or the arrival of messengers. Six of the nine teachers referred to this variable with three reacting positively because they considered the interruptions to be a relief from the ongoing activity of the lesson, while three reacted negatively because they considered the interruptions disturbed pupil attention and the general flow of the lesson. Negative reactions

to administrative interruptions tended to be expressed by the three teachers when the lesson was not succeeding as planned or when the teachers were conscious of the influence of other ecological variables such as time pressures or climatic conditions considered unfavourable for the teaching-learning process.

The second facet (the managerial) of this sub-variable relates to housekeeping tasks that interrupted the flow of the lesson. These tasks involved the teacher in providing equipment and materials for the pupils.

The climatic sub-variable refers to the potential influence of the weather upon both teacher and pupils and their interactions. Only four references were made to this sub-variable which appeared to have no gross influence upon teacher behavior.

The influence of ecological or contextual variables in this study confirm the importance that writers such as Gump (1969), Kounin (1970), Doyle (1977), and Barr and Duffy (1978) have attached to the importance of these variables as influences upon teacher classroom behavior. These writers suggest that the influences of ecological variables upon teacher behavior are as yet little understood and that extensive research is required in this area. The findings from this study support these views.

Objectives

The micro-analysis revealed that all teachers considered lesson objectives in all lessons and that eight of the teachers also considered more general objectives in 13 of the 19 lessons videotaped. As Table 13 indicates, all teachers with the exception of teacher 6-3 in her language arts punctuation lesson, were more cognizant of lesson

specific objectives than they were of general objectives. This aware-
ness of lesson objectives suggests that in the immediacy of the lesson
context, the objectives influenced teachers' behavior by giving
overall direction to the lesson. The interaction between objectives
and teacher beliefs is complex, with beliefs concerning how pupils
learn often determining teacher behavior. For example, teacher 1-3
who believed that repetition was important as a learning process, had
pupils throughout a lesson orally repeat new social studies concepts
as they were introduced.

Information Concerning Pupils and
Expectations of Pupils

Table 6 indicates that all teachers in this study processed
information concerning pupil personality, academic potential and
performance, general classroom behavior, social behavior and home
background. Thoughts containing information about pupils varied from
between 5.5% and 14.2% of the teachers' thoughts reported in the
stimulated recall interviews.

All teachers revealed that they carried around in their heads
a wide range of information concerning "most" pupils in their class-
rooms. This intimate knowledge of their pupils was instrumental in
shaping many of the teachers' interactive behaviors with pupils. For
example, information concerning pupils was used in a variety of ways
in discussion sessions. Teachers 3-2 and 6-2 varied the difficulty and
level of questions asked in order to involve some pupils in the
discussion, not embarrass them, and enhance their self-concepts.
Teacher 3-2 knew the pupils she could rely upon to keep answering
questions so she often delayed asking these pupils questions in order

to involve in the discussion non-volunteers and those who infrequently contributed to discussion sessions. All teachers were aware of those pupils who through shyness or other reasons did not contribute to discussion sessions and efforts were made to involve them in the discussions. Teachers were also aware of those pupils who dominated discussions and efforts were made to minimize their influence. This was often done by ignoring some of the comments and questions from these children.

During discussion sessions teachers often used their knowledge of the pupils to assist the flow of the lesson. For example, if the teacher wished to speed the flow of the lesson she would call on a pupil who she expected would give the correct answer.

While it is assumed that a "good" teacher would be carrying out all of the above behaviors, what is significant is that they are often occurring without the observer being aware of them, as was the case in this study. Teacher awareness of individual pupil differences and efforts to account for these differences during instruction was a prominent feature of the behavior of all the teachers in this study.

Expectations of pupils is a category of thoughts that forms part of the information concerning pupil behavior teachers carry around in their heads. Table 6 reveals that between 1.2% and 9.7% of the thoughts expressed by teachers were coded as expectations. Expectations of pupil behavior partly influenced the ways in which some teachers structured their lessons. For example, teacher 1-1 quickly started a language task with an individual pupil because she indicated that a number of pupils would quickly finish the group task they had started and would be ready for the next task. Teacher 6-1

noted the behavior of a pupil and quickly reprimanded him because she anticipated he would be a behavior problem in the lesson unless quickly checked.

Questions 3 and 4

Research questions 3 and 4 deal with the content of the information teachers process during the interactive phase of teaching and whether grade level, subject area or lesson mode influence teacher information processing. Because of their interrelatedness and because they draw upon the same data, questions 3 and 4 are treated together.

The content analysis system developed to analyse the inter-active thoughts gained in the stimulated recall interviews was termed exhaustive because all of the teachers' recorded thoughts were coded into one of 12 categories. The categories were further subdivided in order to investigate the substantive components of each major category. The 12 categories and sub-categories in the content analysis system, have been listed in Figure 3 and each category is now discussed.

Instructional Moves

In this category the teacher is thinking about an action she had performed, was performing, or could perform at a later stage in the lesson. For all teachers except teacher 1-2, instructional moves contained more thoughts than any other category.

The 14 sub-categories in instructional moves included moves related to facilitating the flow of the lesson, presenting lesson content and psychological principles directly associated with the learning process. Instructional moves related to facilitating the flow of the lesson comprised between 30% and 70% of the teachers'

Figure 3

Summary of Categories in Content Analysis System

1. <u>INSTRUCTIONAL MOVES</u>   Feedback--Teacher; Structuring; Organizing; Control--Discipline; Presenting; Reviewing; Repetition; Reinforcing; Motivating; Feedback--Pupil; Involving; Transfer; Learning Processes; Miscellaneous.

2. <u>PERCEPTIONS</u>   Academic Performance; Student Verbal Behavior; Student Movement; Student Expression; Student Presence--Absence; Noise --Unacceptable Behavior; Equipment-- Materials; Miscellaneous.

3. <u>INTERPRETATIONS</u>   Academic Performance; Student Attention-- Motivation; Student Movement; Verbal Behavior--Noise; Student Cognitive Processes; Materials--Content; Feelings; Miscellaneous.

4. <u>EXPECTATIONS</u>   Task Performance; Cognitive Performance; Affective Performance.

5. <u>MEDITATION--PUPIL</u>

6. <u>SELF-AWARENESS</u>   Instructional Awareness; Instructional Evaluation; Instructional Reflection; Content Reflection; Personal Reflection; Affective Dissonance.

7. <u>BELIEFS</u>   General Pedagogical; Developmental; General Learning; Specific Learning Principles; Memory; General Psychological Principles.

8. <u>OBJECTIVES</u>   General; Lesson Specific; Lesson Facilitating.

9. <u>LESSON CONTENT</u>

10. <u>INFORMATION--PUPIL</u>   Personality; Academic Ability; Academic Performance; Classroom Behavior; Social Behavior; Home Background; Physical Characteristics; General Information.

11. <u>INFORMATION--OTHER</u>

12. <u>FEELINGS</u>

instructional thoughts. These thoughts included the teachers gaining feedback concerning pupil behavior and task performance, structuring the direction of the lesson, organizing (which related to thoughts about classroom managerial matters and future plans), and control-discipline moves.

The sub-category of feedback--teacher indicated that teachers closely monitored pupil behavior in all lessons. The extent of the use of this sub-category varied according to the type of activities undertaken in the classroom as well as the organizational pattern the pupils were in. Feedback-teacher was not prominent in those lessons involving question and answer sessions. However, this sub-category was prominent in the language arts lessons of the first grade teachers when the pupils were working in an integrated day organizational structure. On the other hand, the incidence of this variable was low in the social studies lessons of the three first grade teachers because their pupils were sitting in a small group around each teacher and were involved in discussion sessions.

Teacher thoughts concerning the presentation of information ranged between 2.5% and 25.0% of the teachers' thoughts in the instructional moves category. "Presenting" revealed teachers' thoughts concerning the presentation of content information to pupils and often involved the skills of demonstrating and explaining. Table 7 reveals that presenting was a more prominent feature in eight of the nine teachers' social studies lessons than in their language arts lessons. As these teachers were presenting new facts and concepts to their classes, and as presenting skills were found in all other lessons, the data suggest that presenting skills are related to the presentation of

new materials rather than being subject specific.

Psychological principles associated with learning such as repetition, reinforcing, motivating, and transfer ranged between 10.2% and 51.1% of the teachers' thoughts that were coded as instructional moves. The conscious reference to the use of psychological principles was discussed earlier in this chapter. The only other point to be made here is that teacher 6-1 who included four educational psychology courses in her training, processed fewer instructional moves containing psychological principles than any other teacher. She processed 21% in her language arts lesson and 10.2% in her social studies lesson. However, no conclusions can be made concerning this teacher's instructional style on the basis of two lessons, especially as those lessons contained shorter discussion sessions than the lessons of any other teachers.

Perceptions

The category of perceptions is one in which the teacher reported a sensory experience which included what she saw, heard, smelt or felt. Perceptions was one of the major thought categories in this study and indicated that all teachers in all the stimulus lessons monitored the activities of their pupils and showed an awareness of a variety of pupil behavior in their classrooms. The teachers were most aware of four aspects of classroom life. They were first of all aware of student academic performance and gained this through the instructional move of feedback--teacher which involved them in monitoring classroom behavior. Secondly, the teachers attended to pupil verbal behavior and showed awareness of pupil questions and comments. Thirdly, the teachers were aware of pupil movement in the

class such as walking around the room or raising their hands to seek teacher attention. The fourth major focus of awareness related to materials in the classroom. The teachers showed awareness of the "props" in their environment and generally commented about the materials when there were problems associated with them. This occurred, for example, when a teacher noticed a broken record player.

Teachers also reported perceptions concerning student presence or absence, noise and unacceptable behavior and student expression.

The emphasis given to perceptions of student verbal behavior and student movement supports the findings of Clark and Peterson (1976) and Marland (1977) that pupil response and participation were the cues that teachers observed most frequently.

While not a prominent aspect of reported perceptions, eight of the nine teachers in this study reported perceptions of student expressions such as frowns, smiles and the "expressions" in their eyes. These subtle clues to pupil internal states were reported by the teachers when working in small group or dyadic situations. The only teacher who did not report perceptions of student expressions was teacher 6-1 who with 35 pupils had the largest class in this study. Four teachers also reported in the non-interactive data perceptions concerning student expression. For example, teacher 1-2 reported she knew it was time to finish a group reading session, "because their eyes are tired, they can't sit any longer" and "they wiggle in their chairs, they yawn." The interactive and non-interactive data in this study suggest that in certain teaching situations some teachers do attend to subtle expressions exhibited by pupils. As this finding is at variance with that of Marland (1977) and as perceptions are

important determinants of teacher behavior, there is need for further research to investigate the variety of cues attended to by teachers and in what situations the cues are influential.

Interpretations

Interpretations are thought units in which the teacher attaches meaning or explanation to a perception. Table 6 reveals that interpretations ranged from 10.8% to 22.6% of the teachers' thoughts in the stimulus lessons.

Teachers placed interpretations on a variety of student behaviors and other phenomena in the classroom. Table 9 indicates that teachers in this study referred to nine sub-categories of interpretations. Teachers placed interpretations upon both individual and group academic performance. This sub-category received most emphasis with between 17.0% and 65.7% of the teachers' interpretations attaching meaning to pupils' task performance. Interpretations were placed on student motivational states and student attention, student movements around the room as well as student noise, feelings, verbal behavior and cognitive processes.

Teacher interpretations concerning student cognitive processes normally occurred during "lulls" in a lesson or when observing a pupil completing a task and refer to interpretations the teacher places on the pupils' thoughts and cognitive processing in general. In this sub-category the teacher is explaining how a pupil is learning or understanding something. Teacher 6-2 had over two thirds of her interpretations in her social studies lesson and one third of her interpretations in her language arts lesson in this category, thus evidencing a strong interest in the mental life of her pupils.

Meditation--Pupil

This is a thought category in which the teacher is querying and attempting to understand her pupils' mental processes. The teachers are showing interest in the mental processes of pupils and wonder why pupils remember or do not remember, understand or do not understand and how they solve a problem. Unlike the sub-category cognitive processes in interpretations, the teacher is not placing an interpretation on the pupil's cognitive behavior.

Thoughts in the meditation--pupil category were generally reported during dyadic interactive exchanges with pupils and when taken with the sub-category of cognitive processes in interpretations, indicate at least an awareness by teachers that pupils' mental lives do exist. The fact that teachers rarely probed to find out "why" or "how" pupils were thinking and devoted few thoughts to this area during interaction is perhaps supportive of the claim by Jackson (1968) that the fast pace of classroom life does not give teachers opportunity to focus on such matters.

Expectations

Expectations were discussed earlier in this chapter as one of the factors that influenced teacher behavior. In this section the the focus is more on the content of the expectations. Expectations were held by all teachers in this study and were revealed in all lessons videotaped. Teachers held expectations of pupils' behavior in three related areas. Task performance expectations refer to the physical performance of a task, for example, how quickly students are expected to complete the task. Cognitive performance is concerned with the quality of the task performance that did or did not occur, while

affective performance refers to both positive and negative affective behavior the teacher expects will occur with a pupil or the group.

Self-Awareness

All teachers in this study revealed thoughts classified as self-awareness, with between 3.9% and 13.4% of their thoughts being in this category. Self-awareness indicates the teachers are monitoring their instructional behavior, passing judgement on these instructional activities, reflecting on their lack of content knowledge and reflecting on their appearance and personality characteristics and how these might be influencing the pupils.

Table 11 indicates that all teachers in this study monitored and/or were aware of their behaviors in a variety of ways, and during instruction reflected upon aspects of their teaching. While an awareness of their classroom behavior was shown by all teachers and while the teachers were often critical of their performances, they rarely sought direct feedback from pupils to substantiate their perceptions and interpretations of their influence upon the pupils.

The degree of awareness of the teachers in this study concerning a variety of aspects of their role performance does not substantiate the conclusions of Good and Brophy (1973), Elliott (1977), and Marland (1977) that teachers do not appear to be self-monitoring to any great extent. Marland supports Brophy and Good (1974) by suggesting that teacher self-monitoring is an important teaching skill. If this is so, then further research is needed to ascertain to what extent teachers are self-monitoring and what relationship there is between this behavior and student learning.

Beliefs

In this study teachers interactively revealed beliefs concerning a wide range of general pedagogical principles and psychological principles dealing with motivation and learning and human growth and development. These beliefs were discussed fully in the earlier part of this chapter where it was pointed out that they were important determinants of teacher behavior, but that on occasions their influence was mediated by ecological variables which the teacher could not always control.

Objectives

Objectives refer to pupil outcomes that are to be achieved. While objectives were discussed earlier as determinants of teacher behavior several points of clarification need to be made here concerning teacher thoughts about objectives.

Teachers considered three types of objectives in the information they processed during the interactive phase of teaching. General objectives refer to broad objectives a teacher considered should be stressed in all lessons, or all lessons of a similar type. Table 7 indicates that general objectives were associated with social studies lessons more frequently than with language arts lessons. However, it appears that it is the mode of presentation that was more influential than content area. It is hypothesized that because the social studies lessons were primarily based on discussion sessions and were not as tightly structured as the language arts lessons, that the teachers had scope in which to consider, and involve the pupils in activities that could promote some of the general objectives they held.

An interesting trend concerning the expression of general

objectives is that the three first grade teachers all stressed the objective of "developing their pupils as independent thinkers." To support this objective, these teachers asked during social studies lessons, and in language arts for teacher 1-3, a larger number of higher order questions of the "how" and "why" nature. The Low Inference Data in Table 16 support the teachers' claimed use of higher order questions. In social studies lessons these teachers used higher order questions (process, opinion) more frequently than they used lower order questions (product, choice).

Teachers in this study also referred to lesson content objectives which were specific to the lesson being taught, and lesson facilitating objectives such as, "wanting pupils to sit up," "be quiet" and "mark their work." One can hypothesize that the more discipline and control problems a teacher experienced, the more she would be concentrating on lesson facilitating objectives, to the exclusion of lesson specific and general objectives.

Lesson Content

Thoughts concerning lesson content ranged between 1.4% and 9.7% of the teachers' recorded thoughts. The majority of teacher thoughts concerning lesson content dealt with concepts and factual knowledge to be presented to the class. Very rarely did the teacher's thoughts reveal that she was thinking of content sequence (order within content) or content structure (how the content components are related). Sequence and structure were only mentioned on four occasions in the 19 lessons videotaped. For example, teacher 1-2 considered sequence when she started off her unit on dinosaurs and stated she started with Brontosaurus, "because that's one of the most common ones."

Teacher 1-1 outlined to the pupils her social studies unit on dinosaurs and briefly discussed the five dinosaurs the class would be studying. Her thoughts indicated a reference to content structure when she stated, "and of the five, three of them had obvious armour."

This lack of reference to content sequence and structure, while a point of interest, is not to be taken as a criticism of the teachers in the study. The objectives of the lesson, the thoroughness of the teachers' planning, and the order of the lesson in a unit (if a unit is being presented) are possible reasons why content sequence and structure might not be considered by the teacher.

The teachers in this study tended to concentrate almost exclusively upon the lesson content being presented or worked with during the particular lessons being filmed. While a teacher's thoughts occasionally were centred on past lesson content (31 references were counted in the 19 transcripts) few thoughts about lesson content related to what the teacher would be dealing with in the future.

Information--Pupil

This category of thoughts was discussed earlier as one important variable influencing teacher behavior. The focus of this present discussion is primarily directed to the content of the teachers' thoughts concerning information--pupil. This category of thoughts is concerned with the information a teacher carries around in her head concerning pupil characteristics such as interpretations of personality, academic potential and performance, general classroom behavior, social behavior and home background information. Table 6 reveals that teacher interactive thoughts concerning information--pupil ranged between 5.5% and 14.2% of the teachers' recorded thoughts. Most

teachers indicated that approximately 10% of their thoughts were concerned with various characteristics of their pupils. Even this figure underscores the comprehensive and detailed information teachers possessed concerning the characteristics and behavior of the pupils in their charge. Non-interactive data in the form of case studies support the notion that teachers in this study possessed detailed knowledge about some pupils.

All teachers in this study considered it important to gain detailed knowledge concerning all aspects of their pupils' behaviors. Teachers reported gaining this knowledge through a variety of means. They referred to student record cards, discussed pupils with their past teachers, gained information from parents during parent-teacher conferences and observed pupils in both formal and informal situations.

Knowledge of pupils was considered indispensable to the efficient operation of the classroom. Teachers used this information to guide them in their interactions with individual pupils and indicated in many instances throughout the interview transcripts that they were aware of individual differences. This awareness influenced all teachers in their interactions with individual pupils. Certain pupils who needed reinforcement more than others were given reinforcement, pupils who needed their self-concepts enhanced were given rewards, while certain pupils who needed enrichment activities were given the appropriate work.

Information--Other

This category contained few thoughts. The thoughts in this category related to two main areas, classroom rules and irrelevant thoughts. The data indicate that teachers reported few irrelevant

thoughts and when they did so, it was during stages of the lessons when they did not have direct contact with pupils.

Few classroom rules were referred to and did not appear to play a major part in influencing teacher behavior.

Feelings

Table 6 indicates that teacher thoughts concerning emotions varied between 2.7% and 11.3% of the total number of thoughts reported in each lesson.

Teachers reported a wide range of feelings and it was found that the pattern of feelings expressed varied from teacher to teacher and lesson to lesson. When the lessons were not progressing according to expectations the teachers indicated their feelings were of annoyance, frustration, disappointment and anger. The teachers did not always exhibit these emotions, and invoked the principle of suppressing emotions mentioned earlier in order to protect pupil self-concept. However, the teachers did relay to the pupils their positive feelings and indicated their pleasure or surprise by a smile, verbal behavior or physical contact such as a hug. The use of physical contact to express feelings was practised by the three first grade teachers but not the teachers in third or sixth grades.

Question 5

Question 5 deals with the strengths and weaknesses of stimulated recall methodology when it is used as a research tool.

Few studies have used stimulated recall methodology in naturalistic classroom settings (Marland, 1977). Therefore, one purpose of this study was to evaluate and report on the effectiveness

of procedures associated with the use of stimulated recall as was used in this study.

The filming of teachers during instruction and then conducting stimulated recall interviews to investigate some of the thoughts teachers processed during the instruction pose sensitive methodological problems. The length of the familiarization period, who should select the stimulus points, what type of stimulus points and the length of the interview are issues that have to be met when using stimulated recall methodology.

A minimum of one week's familiarization was carried out with all teachers. During the following week when lessons were filmed and during the stimulated recall interviews, no teachers expressed apprehension concerning the filming, or indicated that it had influenced the structure of their lessons. For example, teacher 3-3 commented in response to an interviewer question:

> I: Did my presence there with the camera influence you in your teaching of the lesson, the way you structured it?
>
> T: Not really, I wouldn't say really. It was more for their benefit as I say that I was trying to amaze them with this stuff.

The behavior of the teachers during the filming of the lessons and the interview session suggests that familiarization procedures were successful.

The methodological data presented in Chapter V suggest that both interviewer and respondents were aware of and comfortable with their roles during the interview situation. All teachers stopped the videotape at stimulus points, contributed a minimum of 75% of the transcribed data and responded readily to interviewer questions.

On only 19 reported occasions did the respondents indicate they could not recall their thoughts. Lack of recall usually occurred when the teachers were not directly interacting with the pupils or toward the conclusion of the interview. It should also be noted that thoughts irrelevant to the lesson were also reported during non-contact periods with pupils. Whether teachers use non-contact "lulls" in the lesson to have "mental breaks," to plan future instruction, or to consider matters not relevant to the present instruction cannot always be answered from the data in this study. One teacher suggested that it was difficult to recall thoughts when she was not having direct exchanges with pupils because there was no specific and prominent stimulus such as a question or response that would "trigger" off recall of her thoughts.

This high incidence of recall compares with the results of studies reported by Bloom (1953) and Gaier (1954) and supports the procedure of conducting the stimulated recall interview within 24 hours of filming the lesson.

The length of the stimulated recall interviews ranged between one and two hours with the majority being approximately one and a half hours in length. The length of the interview should be carefully considered in order to facilitate accurate recall. Several teachers in this study reported feeling tired after one and a half hours of interviewing.

An important procedure in the interviews in this study was to have both teacher and researcher control the selection of stimulus points with the researcher taking responsibility for the selection of the majority of the stimulus points. The data presented in Chapter

V indicate that both interviewer and respondent selected stimulus points over a wide range of interactions. The data on teacher selection of stimulus points indicates they were more than twice as likely to stop the videotape at "Unacceptable Pupil Behavior" than was the interviewer. This finding supports the claim of Bloom (1953) who pointed out that respondents tend to select stimulus points relevant to their needs. Why teachers selected these points was not always clear. One could hypothesize that they chose the points to indicate their awareness of the situation and to rationalize their behavior. This tendency for respondents to show a bias or a particular orientation in the selection of stimulus points should be monitored carefully by interviewers in stimulated recall situations where they do not have the major responsibility for controlling the selection of stimulus points.

Validity and Reliability of Introspective Data

When dealing with the validity of introspective data one is confronted with the problem of determining the extent to which the interviewees' reports of their private thoughts are actually those experienced in the original situation. One is confronted with three linked problems when attempting to establish that the individual is recalling thoughts processed in the original situation. One must first of all ask, can the individual remember, secondly, is the individual reporting his actual thoughts, or is he distorting them for some reason, and thirdly is he only selectively reporting his thoughts?

Gaier (1954) suggested there is no direct technique for establishing the validity of a subject's reported thoughts and that it

is necessary to infer the validity of these reports. Gaier suggested there are several discrete methods by which one can infer the validity of the interviewee's reported thoughts. One method of validation is based on the degree of confidence with which the subjects report their thoughts. One quantitative check is to record the number of "No Recall" responses given. The subjects in this study were specifically asked to indicate when they could not recall their thoughts that had occurred previously in the stimulus lesson. Table 23 reveals that the occurrence of thoughts unable to be recalled was extremely low for all teachers.

Gaier suggested another method of inferring validity is to stop the recording of the stimulus data and have the subject describe the overt events that occur subsequent to the point at which the recording is stopped. This method is based on the assumption that a high degree of relationship exists between the accuracy of an individual's recall of the overt checkable activity and the accuracy of recall of conscious experiences. While it is recognized that this assumption is a tenable one, it is also "recognized that individual needs and motivations act to distort reports of personal experiences to a degree that these reports are never likely to be complete" (Gaier, p. 148).

While the researcher did not specifically stop the videotape recordings of lessons to investigate teacher recall of subsequent overt events in the lessons, the teachers during the interviews, did voluntarily describe overt events which occurred subsequent to the stimulus point being discussed. Table 24 reveals that teachers made references to 62 future overt events in their lessons.

These references were checked against the videotape recordings of the lessons and indicated that in all cases the teachers' references to the future events were correct.

When the interviewer used probing and clarifying questions, the subjects were required to recall future lesson events on a number of occasions. Of the 14 checks carried out by the researcher on teacher recall of future overt events in the lesson, only one proved to be inaccurate.

Other factors, while not establishing the validity of introspective data, can provide conditions that enhance the possibility of the data being valid. These factors include holding the stimulated recall interviews within a 24 hour period, involving volunteers in the research project, providing a low-threat, non-evaluative atmosphere during familiarization procedures and interview procedures (refer to the low percentage of evaluative and leading questions in Table 22) and establishing rapport with the subjects. Bloom (1953), Gaier (1954), and Fuller and Manning (1973) considered the establishment of rapport to be essential if one is to gain valid interview data.

There is no single way to establish the validity of the individual's thoughts. The data reported in this discussion suggest the teachers were accurately recalling and reporting their thoughts associated with the stimulus points in the lessons videotaped and that as Marland (1977) has stated, "validity and reliability can be assumed but not demonstrated or guaranteed" (p. 227).

Chapter VII

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Conclusions

During the past two decades an increasing number of studies
have investigated the behavior of teachers and students in natural-
istic classroom settings. Many of these studies have used observation
systems to code overt teacher behavior, and have contributed much to
the understanding of classroom life. However, there is increasing
recognition of the need to investigate all dimensions of the teacher's
behavior, including the teacher's cognitive processes during
instruction. If it is assumed that thought is a determinant of action,
then, it is suggested that for a comprehensive understanding of
teaching, there is a need to investigate what information teachers
process during instruction, and how their subsequent action is related
to the information processed.

Guided by the assumption that thought is a determinant of
action, the major purpose of this study was to investigate, categorize
and describe the beliefs, principles, rules and other factors (such as
ecological variables) that influence teachers' behavior during the
interactive phase of teaching.

The second purpose of this study was to investigate the content
of the information teachers process during the interactive phase of
teaching, while the third purpose of this study was to analyse the
effectiveness of stimulated recall as a research tool when used in

naturalistic settings.

The conclusions in this study are presented in relation to the five posited research problems.

Questions 1 and 2

These questions are concerned with what beliefs, principles, rules and other factors influence teacher interactive behavior and how and when these variables are influential.

Beliefs

The teachers in this study revealed a great variety of beliefs that were instrumental in guiding their interactive behavior. Teachers revealed beliefs associated with the following areas:

1. All teachers expressed beliefs concerning their roles as teachers. These beliefs were manifested in factors such as the teacher's use of small groups, peer tutors, integrated day organization, the classroom climate they desired, the cognitive and affective behaviors they considered were their responsibility as well as their interactive patterns of behavior with the pupils in a variety of teaching-learning situations.

2. The teachers in this study all revealed beliefs concerning the general classroom behavior of pupils as well as beliefs that were generally associated with the age of the pupils. Beliefs associated with the general behavior of pupils in the classroom appeared to be at the "folklore" level. For example, the teachers considered that the pupils held expectations of teacher behavior and acted in

accord with those expectations. Beliefs related to pupil developmental level were stated in general terms and rarely related pupil behavior to specific stages of cognitive or psychomotor development.

3. All teachers revealed beliefs associated with how children learn or how learning was best promoted, and with how pupils remembered. The teachers were eclectic in their beliefs concerning learning and indicated beliefs that are associated with both behaviorist and cognitive schools of learning theory. For example, the teachers believed that the active involvement of the learner in the learning process, the use of repetition, the need for learning to be meaningful and the involvement of pupils in problem solving were all important learning processes. The data suggest that the teachers in this study consider there is no one best way for pupils to learn and that different processes of learning need to be associated with different tasks.

4. As well as general beliefs concering learning, teachers expressed belief in the use of a number of principles associated with the learning process such as reinforcement, motivation, transfer of learning, and self-concept maintenance-enhancement.

Principles

The data suggest the teachers in this study were influenced by, and used three interrelated groups of principles, namely educational psychology principles, general pedagogical principles and principles

associated with teacher style.

1. The psychological principles used by the teachers in this study reflected the practical application of their beliefs concerning how children learned. Therefore, the teachers revealed in their interactive thoughts that they were using the principles of repetition, reinforcement, motivation, cognitive feedback, transfer of learning and the active involvement of the pupils in the learning process. Not all of the teachers revealed use of all these principles and rarely were they referred to in technical vocabulary. However, the teachers did indicate that they were consciously using these principles, and expressed this consciousness by stating their beliefs concerning the importance of these principles in the learning process.

2. Five general pedagogical principles were referred to and used by the teachers in this study. Not every teacher made reference to every one of these principles which were used during various stages of a lesson or during a particular mode of presentation. While these principles appear to rest upon psychological bases, these bases were not always made explicit. This suggests that a number of the teachers in this study operated upon a "folklore" level or naive level of psychological belief. On the other hand, the questioning procedures used in the stimulated recall interviews may not have been sophisticated enough to ascertain the supporting bases for these general

pedagogical principles.

3. Three major principles associated with teacher style were revealed in this study. These principles indicated that the teachers monitored their own behavior, attempted to present themselves to the pupils as warm, supportive people who were readily receptive to approaches from the pupils, and that they suppressed their emotions to assist with classroom management, the development of the classroom climate and the enhancement of pupil self-concept.

Rules

Few rules were cited in this study. Those rules cited by teachers generally referred to classroom management procedures and appeared to have little influence on the teachers' overall classroom behavior.

Other Factors

Two other major sets of variables revealed in this study appeared to influence the behavior of teachers during instruction. A variable termed idiosyncratic intrusion appeared to represent a dimension of the teacher's value system or personality and influenced the teacher's behavior by intruding into and disrupting the planned flow of the lesson.

A major set of variables, termed ecological, appeared individually and collectively to influence teacher behavior. These variables influenced teacher instructional tactics, lesson organization and at times mediated the influence of teacher-held beliefs concerning teaching and learning.

The findings in this study suggest that teacher belief systems and the incorporated principles which guide teacher behavior are complex and many-faceted. Furthermore, the interactions between beliefs, and between beliefs and other variables, appear even more complex.

Question 3

Question 3 deals with the content of the information teachers processed during the interactive phase of teaching.

The teachers in this study showed marked similarities concerning their styles of information processing and the content of the information they processed.

The nine teachers in the study processed the following information to a lesser or greater degree.

1. The teachers consistently, throughout all phases of all lessons, considered instructional tactics they had used or were contemplating using.

2. The teachers consistently showed awareness through their perceptions of a great variety of student behaviors in the classroom. Gross behaviors were generally reported, however, seven of the nine teachers reported subtle student expressions or movements. Teachers frequently placed interpretations upon their perceptions. These perceptions and interpretations were instrumental in influencing immediate teacher behavior.

3. All teachers in this study carried around a great variety of information in their heads concerning the characteristics and behavior patterns of their pupils.

This knowledge, which helped teachers form expectations for pupil behavior, was also a factor that helped shape teacher-pupil interaction.

4. Teachers revealed beliefs concerning how pupils learned but spent little time reflecting upon pupils' cognitive processes.

5. A salient feature of the mental life of the teachers in this study was that they consistently were aware of aspects of their own behavior in the classroom and were conscious of some of the influences it might be having upon their pupils.

6. Lesson objectives and lesson content were considered by all teachers in all lessons. The majority of the objectives referred to were specifically related to the lesson being taught.

7. Teachers revealed little information that was not relevant to the lessons being taught.

8. All teachers in all lessons revealed emotions that were both negative and positive.

Question 4

Question 4 refers to the influence of grade level, subject area or lesson mode on the content and style of teachers' information processing.

Prima facie evidence suggests that the contextual variables of grade level, subject area or lesson mode did not have a pervasive influence upon the teachers' behavior. Only one noticeable trend warrants mentioning. There were some teacher behaviors that appeared

to be associated with discussion sessions that suggest the need for further research. First of all, when teachers referred to their general teaching objectives they invariably did so in discussion sessions, and secondly, teachers called upon their general pedagogical principles to guide their behavior in discussion sessions more often than in other types of interaction with their pupils.

Question 5

Question 5 refers to the strengths and weaknesses of stimulated recall methodology when it is used as a research tool.

The classroom familiarization procedures, filming procedures and interview procedures adopted in this study appeared to minimize researcher influence upon the subjects. All subjects reported positively upon their experiences in the research project.

The stimulated recall interviews provided a rich source of information and while analysis is complex and time consuming, it is nevertheless rewarding in the insights it reveals concerning teachers' mental behavior during instruction. The use of stimulated recall methodology reveals information concerning teacher behavior that is not apparent to an observer with or without a coding system. Introspective data in this study revealed that much of the teacher's behavior was reflective, that it was guided by beliefs, principles, objectives and expectations whose influence was often mediated by ecological variables. What may have seemed to the observer to be capricious behavior on the part of the teacher was shown not to be so when the teacher's cognitive processes were revealed.

Implications and Recommendations

The results of this study when added to the data base of Marland's work have certain implications for teacher education and inservice education.

Teacher Education

1. This study suggests that the important role given by the American Association of Colleges of Teacher Education to educational psychology in preservice teacher education is warranted. All teachers in this study showed "a psychological awareness" associated with all aspects of their teaching and used a majority of the psychological principles outlined in Table 1 in this study. As well, overarching and general pedagogical principles appear to rest on psychological bases that were implied and at other times explicitly stated by the teachers in this study.

2. The importance of thought as a precursor to action suggests that data concerning teacher information processing could become part of preservice teacher education curricula. What cues teachers attend to, how and why they make certain decisions and the general phenomena they consider about teaching are all important information that trainee teachers should be aware of before they commence teaching.

3. Stimulated recall appears to have value as a diagnostic tool and could be used with some students to analyse their teaching behaviors.

Inservice Education

The richness and complexity of the introspective data suggests that traditional means of supervision involving an observer spending time in a classroom and then commenting on a teacher's "performance" could be an inadequate and superficial approach to supervision intended to improve teacher effectiveness. The findings in this study would suggest that one has to penetrate below "surface" level behavior and find out why teachers are behaving in certain ways before efforts are made to alter their behavior. The data from this study would appear to support the clinical supervision approach advocated by Goldhammer (1969).

Methodological Studies

The use of stimulated recall in naturalistic settings is only in its infancy, therefore, there is need for the different aspects of the methodology to be refined and explored.

1. There is the need for studies to ascertain the general saturation point and tolerance level of teachers concerning the number of stimulated recall interviews that could be carried out with them and over what periods of time.

2. There is a need to select short periods of teacher-pupil interaction, for example, five continuous minutes of teaching and explore in detail information processing.

3. Studies using stimulated recall need to be continued in naturalistic settings, but also need to be carried out in the laboratory setting where independent variables can be controlled and manipulated.

4. There is a need for longitudinal studies to gather data concerning variations in teacher information processing at different stages of the school year such as the start, middle and conclusion.

5. It would appear that when studies use stimulated recall to gather data, there is a need to use overt observation systems related to the phenomena being investigated in order to corroborate the stimulated recall data and assist with its interpretation.

6. There is a need to build on and explore the rich data base provided by stimulated recall methodology by following up with indepth interviews and other data gathering methods such as projective instruments.

7. There is need for detailed case studies to investigate the information processing of "master" teachers in a variety of situations, and also the information processing of teachers not classified as "master" teachers.

Areas of Research

1. As few studies have investigated teachers' information processing during instruction it is suggested that further studies are required to investigate variations in teacher styles of information processing and the content of the information they process. This would suggest the need for further exploratory studies.

2. This study suggests specifically that there is a need to further investigate in detail, teacher information

processing during discussion sessions and during specific teaching behaviors such as explaining, presenting, structuring and questioning.

3. There is a need to investigate the mental processes of teachers when they are working in a variety of organizational settings in order to ascertain their coping strategies.

4. This study has revealed that teachers process information concerning beliefs and a variety of psychological principles. This data base requires adding to in order to contribute to theories of teaching.

5. There is a need for studies to investigate how teachers acquire beliefs, overarching principles and general pedagogical principles.

6. The importance of beliefs in determining teacher behavior suggest that there is need to investigate if teachers possess hierarchies of beliefs.

7. The pervasive influence of ecological variables upon teacher classroom behavior suggests that research in this area could contribute to an understanding of teacher behavior in the classroom. Research in this area would appear to be particularly appropriate in open classroom settings.

8. This study indicated that some teachers do attend to subtle expressions of pupil behavior. If perceptions are important in influencing immediate action, then there is need to further investigate if teachers attend to subtle

cues, how they interpret them, and how these cues influence teacher behavior.

9. If, as Brophy and Good (1974) suggest, teacher self-monitoring is one indicator of effectiveness, this behavior characteristic of teachers requires further detailed investigation.

10. There is a need to investigate the thought processes of students in order to gain their perceptions of teacher use of principles such as motivation, reinforcement, and self-concept maintenance-enhancement. This information would provide teachers with feedback concerning their teaching and could also contribute to theories of teaching and learning.

11. There is a need to investigate the relationships between general pedagogical principles used by teachers in this study and pupil product measures.

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APPENDICES

APPENDIX A

PRE-LESSON INTERVIEW SCHEDULE

Pre-Lesson Interview

The purpose of this interview, carried out just prior to every stimulus lesson videotaped was to gain general information about the lesson that could be used to assist in the interpretation of the teacher's interactive thoughts and also to develop lesson vignettes. On the advice of Marland (personal communication, January 1977) the interview was deliberately kept short and was structured so that the teacher was not forced to rationalize, justify or alter his plans.

Organization of the Interview

1. The interview was audiotaped.

2. The interviewer commenced the interview with an open-ended question that gave scope for the teacher to reveal the extent of her planning concerning the lesson's objectives, content, organization and materials to be used. The question used was: "What will be happening in this lesson?"

3. If the teacher made no mention of lesson objectives, content, organization and materials, then general, open-ended probing questions were used to elicit the required information.

4. The interviewer observed the following strategies:

   - avoided asking evaluative questions or passing judgement;
   - avoided asking leading questions and making suggestions about the teaching of the lesson;
   - when confirming or clarifying, built upon the teacher's words;
   - avoided having the teacher describe the lesson in the minutest details. The interviewer was cognizant of not wanting "to lock" the teacher into a structure which would inhibit her teaching behavior.

APPENDIX B

DESCRIPTION OF CATEGORIES IN THE LOW INFERENCE
CLASSROOM OBSERVATION SYSTEM

Section I.   Summary of Categories in the Expanded
Brophy-Good Teacher-Pupil Dyadic
Interaction Classroom Observation
System

Section II.   Definitions of One Modified Category
and Two New Categories in the Expanded
Brophy-Good Teacher-Pupil Dyadic
Interaction Classroom Observation
System

Section I

Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System[1]

The major aspects of classroom life coded by this system are represented by the four cells in the diagram appearing below. Within each cell are the sub-categories of those four aspects which are then further broken down into still smaller units.

	Public response opportunities	Private dyadic teacher-pupil contacts

Teacher afforded	A.
	    I. Respondent-type
	   II. Questions-type
	 III. Response-type
	  IV. Feedback-type
		C.
		   I. Work-related
		  II. Personal
		 III. Procedure-related
		 IV. Behavior-related
		  V. Don't know

Student Initiated	B.
	   I. Student Initiated Questions
	  II. Student Initiated Comments
		D.
		   I. Work-related
		  II. Personal-related
		 III. Don't know

A. Teacher Afforded Response Opportunities

The three key aspects of this category of classroom event are:

(a) they are public interactions between the teacher and a child, intended to be monitored by the class or group with which the teacher is working;

(b) they occur when the teacher asks a question requiring either a verbal or nonverbal response;

(c) only one child makes the response.

For each response opportunity that is coded, information has to be checked off in each of four sub-categories: (1) type of response opportunity; (2) level of question asked; (3) quality of child's answer; (4) nature of the teacher's feedback reaction.

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[1]Based on summary from Marland (1977).

I. Types of response opportunity

Predesignated (PRE):   teacher names the child first and then asks a question;

Non volunteer (N. VOL):   teacher asks a question first but calls for a response from a child who has not raised his hand;

Volunteer (VOL):   teacher asks a question first and invites a response from a child with hand raised;

Called out (CALL):   teacher asks a question but a child calls out the answer before the teacher has a chance to select a respondent; the teacher nevertheless responds to the child who called out the answer.

II. Level of question asked

Process (PCSS):   question requiring student to integrate facts or show knowledge of their relationships.

Product (PROD):   question for which a specific correct answer is sought.

Choice (CHOIS):   question requiring an answer to be selected from one of the alternatives presented.

Self Reference
(SELF REF):   question requiring child to make a non-academic contribution to the classroom discussion. This type of question has then to be further classified as subject-matter related (SUB) or non subject-matter related (NON SUB) and then whether it requires the child to show a preference (PREF) or to give information about his past experience (EXP).

Opinion: question requiring student to take a position on an issue or to predict the outcome of an experiment or hypothetical situation. If the child gives no response (NR) this is coded. On the other hand if the child does respond, the teacher's reaction to the answer is coded: if it is praised ($\ddagger$), criticized ($=$), ignored (0), accepted (ACPT),

integrated (INTEG), into the ongoing
discussion, or if the teacher
disagrees (DISAG) with the child's
opinion.

III. Quality of child's answer

The child's answer is coded as correct (+), partially correct
($^+_-$), incorrect (-), or no response (NR) but, if the child
indicates that he doesn't know, this item of information is
also coded.

IV. Nature of the teacher's feedback response.[2]

The teacher's reaction to the child's response has been
categorized as terminal or sustaining. Reaction which is
terminal, that is, it has the effect of terminating the inter-
action with the child, could be one of seven types. The
teacher may praise ($^+_+$), criticize ($^=$), provide no response (NR),
give process feedback (PCSS), give the correct answer (GIV ANS),
ask another (ASK OTH) child for the answer, or the answer may
be called out (CALL) by another student. Reaction which is
sustaining, that is, it has the effect of prolonging the inter-
action, could be one of three kinds. The teacher may repeat
the question (REPT Q), rephrase the question or give a clue
(REP or CLU), or ask a new question (NEW Q).

B. Student Initiated Response Opportunities

I. Student Initiated Questions

This category of response opportunity is used if the student
asks the teacher a question regarding the subject matter under
discussion or some other matter. If the student calls out
(CALL) the question without prior teacher approval, this
point is coded and also if the question is relevant (REL) or
irrelevant (IRREL). Two kinds of teacher reaction to the
question, praise ($^+_+$) and criticism ($^=$), are coded if they
occur, and also types of teacher feedback. The teacher may
provide no feedback (O) (i.e. ignore the question), delay
(DELAY) her answer, not accept (NACPT) it into the discussion,
provide a brief or long answer or she may redirect (RDRCT)
the question to another student. Three other categories
praise ($^+_+$), criticism ($^=$), and warning (WARN) are provided
if the teacher makes a reaction related to the student's
behavior in initiating the question.

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[2]Modifications to the sub-categories of teacher feedback as
defined in the Expanded Brophy-Good System were made and are reported
in Appendix B Section II.

II. Student Initiated Comments

The details surrounding a student initiated comment that are coded are very similar to those for a student initiated question. All but three teacher response categories, brief long, and redirect (RDRCT) are retained. They are replaced by another three. The teacher may accept (ACPT) the student comment, integrate (INTEG) it into the class discussion, or may use it to shift the direction of the class discussion.

C. Teacher Afforded Dyadic Contacts

I. Teacher Afforded Contacts (Work-related)

These are instances when the teacher makes private contact with an individual child about his work. Several features of these contacts are coded. The contact may be long, brief or it may be one in which the teacher just observes (OBSV) without entering into verbal interaction. If the contact is a long or brief one, praise (∓) or criticism (⁻) is coded also if the teacher's comments include such reactions. A don't know (?) category is used if the interaction between teacher and child is not audible to the coder.

II. Teacher Afforded Contacts (Personal)

These contacts do not involve either work content or procedure but are of a strictly personal nature.

III. Teacher Afforded Contacts (Procedure-related)

Within this category a distinction is made between those instances when a teacher seeks a favor (child helps in running the classroom) and those in which the request has to do with getting the child ready to work. The latter are coded as management (MANAG). Thank you (THANKS) is coded if the teacher thanks the child following the management or favor request.

IV. Teacher Afforded Contacts (Behavior-related)

This category is used whenever the teacher makes some comment on the child's classroom behavior. They are sub-divided into praise (∓), non-verbal intervention (NVI), warnings (WARN), and criticism (⁻). Errors which the teacher makes when warning a child are also noted. Three kinds of errors, target errors (TARG), timing errors (TIM), and overreactions (OVERT) are coded. The no error category is used whenever the teacher does not make one of the three errors. Provision also exists for the coder to record his uncertainty (?) if he is not sure that an error has occurred.

V. Don't know (?) is coded if the teacher-pupil communication is

inaudible to the coder and the coder is unable to determine which of the above four types of teacher afforded contacts is occurring.

D. Student Initiated Dyadic Teacher-Pupil Contacts (referred to as Child Created Contacts on the coding sheets)

   I. Child Created Contacts (Work-related)

   This type of contact may relate to work content (CONT) or work procedures (PROC). The teacher's feedback to the child is also coded, whether the teacher offers praise ($+$) or criticism ($-$) and whether the contact is brief, long, or delayed (DELAY) by the teacher.

   II. Child Created Contacts (Personal-related)

   In this category there are two first-order divisions, experience (EXP) sharing and procedural (PROC). All experience sharing contacts are personal ones in which the student contacts the teacher to tell him something which is not related to either classroom work or procedure. The teacher's response is coded as either acknowledged (ACK) (i.e. the contact is acknowledged by the teacher) or delay (i.e. the teacher indicates she is unable to listen or talk to the pupil at that time).

   A procedural contact occurs when the pupil is making a request, offers to do an errand, or reminds the teacher of something. The teacher's reaction is coded as grant or non-grant (N GRANT) (teacher has or has not granted the request) or as delay.

   III. Don't Know

   If the communication in the child created contact is inaudible to the coder, the don't know (?) column is used.

Section II

Definitions of One Modified Category and Two New Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

No Feedback Reaction (0)

This category of terminal teacher feedback in the Brophy-Good system has been restricted in meaning in this study. This part of the original statement now embodies its full meaning.

"If the teacher makes no response whatsoever following the child's answer to the question, he is coded for no feedback reaction (0). This means that he makes no verbal response to the child and does not communicate affirmation or negation by shaking his head in response to the answer. Instead, he merely moves on to something else, perhaps by starting to make a new point or by asking another child a question. . . . It frequently happens that the teacher makes no feedback reaction at all to the child's answer, especially in fast moving question drills where he is pushing to get correct answers in an impersonal fashion, without paying attention to the individual child giving the answer" (Brophy & Good, 1970, p.17)

Affirmative Teacher Reaction (AFFIRM)

This category of teacher reaction within an academic response opportunity is defined as a terminal teacher reaction which does not go beyond the level of simple affirmation. The teacher simply indicates that the child has given a correct response. He does not communicate a warm personal reaction to the child. There is merely an impersonal communication of information. For example, the teacher repeats the student's answer or thanks the pupil without explicit or implicit praise. The teacher's intent is to terminate student involvement.

Repeats Student Statement (REP SS)

This is an additional category in the set of teacher reactions in academic response opportunities described as sustaining. In this category are to be coded all those instances when the teacher repeats the child's answer in a quizzical manner without indicating whether he considers it to be correct or incorrect, or when the teacher restates the pupil answer for the purpose of having the student confirm what he had just said. The statement sustains the pupil's involvement in order to clarify for himself and/or others the meaning of his previous response.

APPENDIX C

MATERIAL TO BE PRESENTED TO, AND
DISCUSSED WITH THE INTERVIEWEE

<u>Stimulated Recall Interview</u>

<u>Material to be Presented to, and Discussed With the Interviewee</u>

Introduction

During the past ten years "Teaching" has received increased emphasis from educational researchers. A number of researchers have maintained that research into teaching can only take place in the classroom and that through observation of the teacher's overt actions information can be gained that will assist in the development of theories of instruction. However, to more fully develop theories of instruction and improve teacher education and school curricula, researchers have also postulated the need to understand teachers' thought processes.

Objectives of the Research

At the present time very little is known about teachers' thought processes during instruction. These processes are the focus of interest of this research project. The objective of this research is to find out what information teachers use during instruction, why they use this information and how they process this information. The thoughts teachers have when they are explaining, reviewing, questioning and drilling etc. and making decisions is of special interest. How well the lesson was taught is <u>NOT</u> the focus of the interview.

Role of the Teacher/Interviewee

The method used in this research project to obtain data on teachers' information-processing during instruction is called "stimulated recall." Asking teachers to recall after a lesson the

thoughts and feelings they experienced whilst actually teaching the lesson has not proved very satisfactory. Recall of thoughts and feelings is facilitated when teachers are shown a videotape of the lesson. Seeing events in the lesson on videotape helps to trigger or stimulate recall--hence the term "stimulated recall."

Whereas it is possible to have people in some professions "think out loud" about their professional duties because they are not interacting with other people, it is not possible to do this with teachers because it would interfere with the instructional process.

We know that the mind works faster than the voice. As teachers interact with children in the classroom they:

- become aware of many more classroom events than can be inferred from their verbal and overt non-verbal behavior;

- react to classroom events intellectually and emotionally in ways which even the most perceptive observer could not detect because they are internal. Many reactions, inter-pretations and diagnoses of pupil behavior are not revealed to the observer;

- make numerous decisions about what to do and say next or at some future point in the lesson, or what not to do or say. The alternative courses of action considered, the reasons for the final choice of action are frequently not declared or revealed; the observer is not privileged with this "inside" knowledge and with the various rationales used to make decisions;

- use many rules, principles and instructional strategies that the observer is not aware of.

As the teacher relives the lesson by viewing the videotape, he/ she is invited to provide a detailed account, to talk aloud, about:

1. Thoughts, feelings, moment-to-moment reactions during

   instruction,

2. Conscious choices (i.e. when you chose to do or say one

   thing rather than other things, or when you chose to say or

do nothing) and the <u>reasons</u> for choosing to do or say that particular thing.

<u>Note</u>:

1. You may stop and start the tape as often as you wish.

2. The interviewer will also stop the tape on some occasions to ask you if you can recall your thoughts, feelings, reactions, etc. in relation to certain classroom events.

3. The interviewer's role is simply to assist you to recall what you thought and felt during the lesson.

4. As you view the tape you will probably form new impressions of the lesson and of events which occurred during the lesson, and think of other things that you might have said or done. Try to distinguish during the interview between the thoughts and feelings you had during the lesson and those you had after the lesson or when watching the video-tape; ensure that the interviewer is aware of the distinctions too.

    If you have any questions, the interviewer will be pleased to discuss these with you prior to the interview.

APPENDIX D

TECHNICAL PROCEDURES

Technical Procedures

Procedures and strategies relating to the use of audiovisual equipment in this study, are described below.

1. For stimulated recall interviews, the VTR that takes half inch reel-to-reel tape was found to be preferable to the model that uses three quarter inch tape cassettes. The reel-to-reel model permitted instant stops at specific points, whereas the three quarter inch model did not have as much precision.

2. The investigator found it preferable to use the one set, or identical equipment throughout the research project. This was done in order to avoid unsettling the subjects with the introduction of equipment that might be noticeably different.

3. All equipment was set up at least half an hour before filming and checked to see that sound and film images were clear. However, this researcher found that once teacher and pupils had become familiar with the equipment, then the familiarization phase of the study was facilitated by assembling and dismantling the equipment at various times during the familiarization period. This was done so that it would not unduly disturb the class if for any reason the equipment had to be assembled or dismantled during a lesson.

4. All equipment, including extension cords, was placed so that the pupils' and teacher's normal classroom movements were not disturbed.

5. It was found that to most efficiently keep the focus of the camera on the teacher, that the camera, monitor and VTR should be placed in one of the rear corners of the classroom. It was considered that for the purposes of stimulated recall that it was more

important to film the full facial expressions of the teacher as opposed to the frontal facial expressions of all the children.

6. The T.V. monitor was placed away from the view of all children so they would not become distracted. The monitor sound was turned down so it could not be heard by the teacher or pupils.

7. During filming, the researcher used the technique of keeping the teacher and the whole class in focus as much as possible and then during dyadic or small group interactions "zooming" in upon the teacher and pupil or pupils. As the teacher was the "target" object in the research, the technique of keeping the camera on her the majority of the time was employed. However, care was taken always to include the teacher's foci of interest in the camera range. It was found that it could be a distracting digression in the stimulated recall interview if the camera focused on events that the teacher was not aware of or participating in.

8. The quality of the film image and sound was monitored throughout each lesson filmed.

    a. The film quality was checked by referring to the viewer at the back of the camera and the image on the T.V. monitor screen.

    b. Sound was checked directly by the use of an earplug. Use of an earplug was preferable, as monitor sound can cause feedback noise which could disturb the teacher and class.

    c. The researcher continually checked for extension microphone cords being disconnected and children accidentally switching off the microphone.

9. Before filming, the VTR counter was set at zero and the number

that filming finished on was noted.

10. It was found that the Sony F-540, a directional microphone, was sensitive enough to pick up sound within a radius of 15 to 20 feet. The researcher developed the strategy of finding out from the teacher where most of her movements would occur during the lesson so that the microphone could be placed to pick up the maximum sound of the interaction between teacher and pupils.

11. Several points should be noted concerning the use of tape recorders in this research project.

    a. Because of their portability, cassette recorders were preferred to reel-to-reel recorders.

    b. When recording, the researcher always checked to see that both play and record buttons were pushed.

    c. The use of an extension microphone attached to the cassette recorder was used to allow the interviewer more mobility during the stimulated recall interview.

    d. The quality of the recorded sound was monitored throughout the interview.

    e. During the interview situation, the cassette recorder was placed unobtrusively so as not to distract the subject's attention from the T.V. monitor and the interview itself.

APPENDIX E

EXAMPLES OF STIMULATED RECALL
INTERVIEW TRASNCRIPTS

Teacher 1-3 Language Arts

Time	Event		
$2\frac{1}{2}$	Teacher directs two pupils to work	I:	Did you have any thoughts then you know, with X and Y, any feelings?
		T:	No, I think I guess knowing these two boys quite well, I know if I hadn't said something they would have wandered around the whole period and not have accomplished a single thing. It probably would have been more of a disrupting factor then. They wouldn't have been doing any good then, that's why I called to them right away instead of allowing them to cause a big disruption for us.
		I:	Sort of later on?
		T:	Yes.
4	Pupil describing event in a story	T:	I was thinking about his description at that time. I had a laugh how he described it because it didn't come out in the story and I was thinking to myself at the time how a child would immediately react to that. How would he know that it was mirror? He said to me, "He walked around," and I asked him did he run away. "No he walked around the mirror," no he could tell it was a mirror. I had to kind of laugh because at that time in the year you know how they really, what they would think in a situation in a story like that, it just kind of made me curious there.
$4\frac{3}{4}$	Teacher directs pupil to work. Told him he was at centre eight.	I:	Any thoughts when you mentioned X there?
		T:	That was a point just before that, that little girl came up and told me X wasn't working and I had been watching him playing for quite a while and I really, I just, I guess I don't know really what I was thinking at the time I just muttered, "Come on, get going at it again." Not really feeling that he was doing anything that was really disrupting to anyone else except to play with but not doing anything, you know that just that he needed a reminder to get working. Other than that there was nothing that was significant there.
$5\frac{1}{2}$	Pupil wanting scissors	T:	At this point right here, this little guy in here I know I was starting to get a little bit frustrated with him because he came out to get scissors again, he has a continual thing with scissors, he's always losing scissors and when I had to get up and leave the reading group because he couldn't find scissors again, well it was kind of a little bit of distraction that was too much type of distraction. I had to pull the students away physically from their reading books.
		I:	Do they all have their own pairs of scissors?

Teacher 3-1 Language Arts

Time	Event	
13½	Pupils voted on content of story	T: There I was thinking X had written a story about a cat, something and a cat and I could see she was on one tack now, cats, so everything was going to be written about cats so I was kind of hoping they wouldn't choose that one. They didn't.
14	Pupils voting twice on choice of problem for the story	I: You went through the selection procedure twice then to get a choice. What were your reactions then and especially when they decided on it?
		T: A tension, because I knew that some of them hadn't raised their hands at all, they were just kind of sitting there and by stopping and doing it all over again, I knew I would pick up a few. I knew they hadn't been responding. I was at that point in fact, very aware of Y. He was sitting at the table and I knew that he hadn't raised his hand, he was one that hadn't put it up and I was disappointed because he's an excellent story writer and I had expected him to kind of lead the way maybe with the story, get it on the right track. This is why I was generally disappointed in the lesson because there's about five of them there that could have, and I chose them deliberately to start the story, to get it off on the right track and they kind of let me down. They got off on the wrong track and Y just didn't say anything, and Z was fooling around, and the other three that I asked kind of got off to a mediocre start. So I had kind of anticipated they would lead it along and they didn't, so I was, I had my eye on Y there at that point. Wondering why he hadn't said anything.
15	Pupils choosing part of content of story.	I: Did you have any particular thoughts about their choice of topics then?
		T: I knew it wasn't a good choice. I could tell at this point the story wasn't going to develop very well but I figured it's their choice, they're going to have to work with it, so.
16	Spontaneous thought by teacher	T: Right there, the thought that hit me is there's a book in the library called "The Emperor and the Nightingale" and I was just mentally saying to myself I should bring it in and read it to them because they'd be interested in it as a language project and also as social because it's about the Japanese Emperor. So that's why, later on, he just said a bird, and later on I called it a nightingale which was quite unconscious.
		I: You didn't do that deliberately?
		T: No I didn't. And then I realized after I said it I thought, I've put the ideas in his mouth, I shouldn't have said that.

Teacher 3-2 Social Studies

Time	Event	
9	Pupils' answers to teacher's question about manufacturing	**I:** I'll just pause there for a second. Were you having any specific feelings or thoughts about the children's responses then? **T:** No, just a generally good feeling that they were getting at what I wanted to get at. They realized that these things were manufactured in Japan and they weren't having any trouble with that at all. I think when you study another nation and can find samples of that in your own home, it helps to make it a little more alive and real to them. I felt good about it. **I:** Oh right.
9½	Pupil asked teacher a question about sea shells as a product	**T:** That rather bothered me there a little bit, because her questions, I felt at that point that I hadn't gotten the other points across to her at all. So I thought, O.K. it does need clarifying. I often wonder about X, she's often inattentive or appears to be inattentive, and, you can't always tell with kids you know, whether they are truly inattentive or whether they're just mulling over what has been going on, and in this case she hadn't been mulling anything over I don't think.
10	Question to pupils to check on comprehension of concept of whether Japan exported or imported food.	**I:** What were you thinking or considering when you asked them how many agreed or how many disagreed? **T:** Oh I wanted to see just how many of the kids were like X, that they had more or less missed the point and also how many of them had forgotten the previous lessons where we talked about food production in Japan, and how yes they can be basically self-supporting, but every square inch of available land has to be used to its utmost. And a few had completely, it seemed, forgotten that, so it was a good thing in my mind, that she had brought it up again.
11	Pupil asked teacher a question about Japanese flag on plane	**I:** Y brought that question up did he? **T:** Yes Y did. This bothers me too in the lesson. When I was student teaching, I always had notes right in front of me because I always forget things that I want to bring out, and I was glad Y asked me to go back to that one, because, again, I had forgotten about a point that I wanted to bring out. I get very annoyed at myself when I do things like that. **I:** Would you have notes if the lights weren't switched off? **T:** No, I should I suppose. But generally after I've taught a lesson I'll go back to the material itself and see what I have covered and what I haven't and pick it up the next day sort of

Teacher 6-2 Social Studies

Time	Event	
$20\frac{1}{4}$	Teacher asked pupil to come out to write answer on chalkboard	I: Any thoughts when you were picking X to come out? T: Well, to be honest, we were running short of time, X's a quick writer, so I knew that he would get it up there very quickly so that we could be on to something else. That is basically why I chose him. I: Oh no, that's fine.
$20\frac{1}{2}$	Teacher observing and reacting to pupil performance	T: And then he goofed it and didn't put it down properly after all, so that that was the one where they reversed the words so I had to draw it to their attention after. So when he was there I thoughts, "Oh boy, I had chosen X, because he was going to do it quickly and then he was the first person to come up and make a goof. I: And what were your reactions when he made the mistake? T: Well I just quickly had it corrected by the rest of the class when he sat down.
$21\frac{1}{2}$	Teacher discussing vocabulary word "congested"	I: What were you thinking about when you brought the word "congested" into the discussion? T: I always bring up vocabulary, words that are in common usage all the time. I find that their vocabularies are so small at this age and how could they be expected to put the words in the proper order if they didn't understand the meaning of one of them. So any time there's a word that I think that some of the class is going to have difficulty understanding I always bring it up in any subject area.
22	Teacher asking pupils to give answers to "difficult question"– the most difficult task	T: Even though I knew they had done it incorrectly I thought they should have a chance to say their guesses anyway. Because if I'd just said "Well none of you got it so I'll put it on the board," they won't attempt next time in that kind of a situation, to figure it out for themselves. I: And that's why you went to that group was it? T: Yes.
$23\frac{1}{2}$	Teacher introduced vocabulary word "corrupt"	I: I can't remember now, what were the thoughts and reasons for "corrupt" being introduced there? T: Just simply because I knew they wouldn't know what "corrupt"

APPENDIX F

CONTENT ANALYSIS SYSTEM

Content Analysis of Teachers' Interactive Thoughts

Introduction

This content analysis system was developed in order to classify the thoughts of teachers that occurred during the interactive phase of teaching. In other words, the system was developed to ascertain and classify the information teachers processed as they interacted with the pupils in their classrooms.

The development of this system was guided by three major factors:

1. The stated research questions.

2. The type of research data gathered.

3. The previous work of researchers in this area, namely Bloom (1953), Taba, Levine and Elzey (1964), Hawes (1972) and Marland (1977).

The underpinning theoretical guidance for the overall development of the content analysis system was provided by Guetzkow (1950) and Holsti (1969).

The major research question in this study focussed upon the principles, beliefs, theories, rules and other factors that might guide a teacher's behavior during the interactive phase of teaching. The implicit assumption underlying this question is that by understanding mediating thought processes one has a more rational basis on which to understand and evaluate overt teacher behavior, and eventually contribute to a theory of teaching.

While the content analysis system is designed to focus on and code teacher beliefs and principles, it is also designed to analyse and

code teacher thoughts on a variety of other phenomena that occur during the interactive phase of teaching. For example, teacher perceptions and interpretations of various stimuli in the classroom.

Data

The data analysed in this project consisted of transcripts containing teacher thoughts that had occurred during a previously taught lesson. The thoughts were elicited by using stimulated recall methodology. The teacher's lesson was filmed and during a dyadic interview situation held within 24 hours of the lesson being taught, the videotape was replayed, stopped at selected stimulus points, and the teacher asked to recall her thoughts. The rationale supporting stimulated recall is that an individual can recall the original situation and attendant thoughts with accuracy if a sufficient number of cues or stimuli which were present previously are re-presented to her (Bloom, 1953).

The transcripts, therefore, consist of interview data which is comprised of teacher thoughts that have been verbalized about a particular incident or incidents shown on the videotape. The interview data also contained investigator verbal behavior which predominantly comprised open-ended initiatory questions and probing questions. When the teacher has expressed her thoughts concerning a particular stimulus incident, then the videotape is restarted again.

The stimulated recall procedure also revealed data that were classified as non-interactive. These data were not the actual thoughts a teacher had during the lesson and took several forms. These data consisted of:

1. General teacher comments concerning the videotaping of the

lesson or the nature of the interview situation;

2. Dialogue during which the teacher is attempting to provide a rationalization for her behavior;

3. Dialogue during which the teacher expands upon the interactive data in an attempt to clarify the situation for the interviewer;

4. Dialogue during which the teacher refers to lesson plans or thoughts (preactive data).

Coding

The coding in this content analysis system consisted of three major steps:

1. Identification of interactive data.

2. Unitization.

3. The placement of the units into categories.

Identification of Interactive Data

Interactive data (Jackson, 1968), refers specifically to the thoughts and feelings that the teacher was consciously processing during the stimulus lesson. Any thoughts revealed during the interview that were associated with events prior to, or after the lesson, are not to be coded. The training of the teacher for her role in the interview situation involved stressing that it was only the conscious thoughts that had occurred during the lesson that the researcher was seeking. As a check on teacher understanding of her role, the interviewer continually used confirming questions as a checking tactic.

For example:

I: Were you consciously thinking, "Well I must mention rotation again"?

I: Were they your thoughts then?

I: Were you consciously thinking that?

The interview transcripts, therefore, contain many clues from both interviewee and interviewer behavior that indicate whether data is interactive or non-interactive. Some clues which illustrate interactive data are listed below.

T: Right there I was wondering . . .

T: There I was thinking . . .

T: At that point there I was thinking . . .

I: And what were you thinking then when he put his hand up?

T: I thought that's my fault, he didn't understand again.

Just as there are obvious clues indicating that data is interactive, there are clues which indicate that the teacher is revealing non-interactive thoughts and feelings. Examples of obvious clues are listed below.

T: I think I said what, how they felt if you touched them. I don't know if that's what I said or not.

T: What was I thinking about when I introduced the book?

T: I didn't realize I spoke so slowly.

I: So you weren't quite certain whether it was or not?

T: No, she might do it just for a joke.

Guidelines

Obvious clues are not always present to assist the coder in distinguishing between interactive and non-interactive data. The coder is urged to carefully consider contextual clues that may occur prior to or subsequent to the data being analysed. The confirming and clarifying questions of the interviewer should always be carefully

noted when deciding whether data is interactive or non-interactive. The stimulus point described on the side of the transcript should also, always be referred to when deciding whether data is interactive or non-interactive. Often the stimulus point will provide the contextual clue which indicates the interviewee is not recalling thoughts associated with the stimulus point but is instead engaging in such behavior as rationalizing her behavior, referring to previous lessons or presenting general beliefs about teaching.

Specific Guidelines

These guidelines for distinguishing between interactive and non-interactive data are based upon those developed by Marland (1977). Examples of non-interactive data accompany each guideline. Where interactive data is included for illustrative purposes, it is enclosed in brackets.

Guideline 1

Label as non-interactive all sections of the transcripts in which the teacher is describing or recalling what she was saying or doing, or what she had done, instead of what she was thinking.
Examples:

    T: I went. I just came back from getting her.

    T: We have just had a little conversation there with him, I mean I had.

    T: It happens all the time so I wouldn't be thinking too much about it.

    T: And I was asking her.

Note 1. Statements which indicate the teacher saw or heard a student perform some behavior are to be coded as interactive since it

is obvious the teacher was consciously monitoring or processing the pupil behavior during that segment of the lesson.

Examples:

> T: I walked down the row (and heard him call out).
>
> T: As I read, (the noise grew louder).

Note 2. When the teacher is describing or referring to a teaching strategy or action to be carried out in the lesson and her description contains reasons, purposes or consequences, then the data are to be coded as interactive.

Examples:

> T: (I was just keeping track of what's going on in the classroom,)(to make sure they are all working).
>
> T: (It was too loud). (It had to be stopped).
>
> T: (I waited a couple of seconds to see if they'd notice) (or if I would have to call out).

Guideline 2

Label as non-interactive those sections of the transcripts in which the teacher is showing awareness of what she was doing rather than of what she was thinking.

Examples:

> T: I was conscious of looking at the board.
>
> T: I was aware my hands were moving up and down.

Guideline 3

Label as non-interactive those sections of the transcripts where the teacher repeats the interviewer's dialogue or asks a question of the interviewer.

Examples:

> I: What were your thoughts when she was describing the incident to you?
>
> T: When she was describing her situation, her problem?
>
> I: Yes.
>
> I: And why did that surprise you? Can you recollect?
>
> T: Why did it surprise me?
>
> T: As far as what?

Guideline 4

Label as non-interactive those sections of the transcripts in which the teacher is engaged in general discussion about the background characteristics of her pupils.

Examples:

> T: I've seen the other kids help him a lot, but they help him by telling him the answers.
>
> T: Well there isn't enough change as I would like. Ideally I would like to regroup them whenever necessary to take the kids who need practice in a certain skill or a lesson on a certain skill.
>
> I: Can I ask you why you started the individual work with that boy?
>
> T: Yes, I used to have them sign up every morning, about eight or nine, eight sign up for it if they wanted a conference that morning and I discovered that a lot of them simply weren't signing up for various reasons.
>
> T: Yes, he smiles and he gets embarrassed and he wiggles and squirms and when the embarrassment gets too strong that's when he pulls away consciously.

Guideline 5

Label as non-interactive those portions of the protocols where the teacher indicates any uncertainty about thoughts and feelings being interactive.

Examples:

> T: Right there I was probably wondering, Anita's a very poor speller.

> T: Well it's hard to say though at a particular time, was I having that thought.

Guideline 6

Label as non-interactive those sections of the transcripts where the teacher, stimulated by the videotape is discussing general features of her class or the lesson.

Examples:

> T: This is my rhythmic group here. It's a little too large, the group had eight, too many.

> T: I didn't realize there was so much movement in the room during the lesson.

> T: It looks like everything's going so smoothly right over there. The two Michaels were causing, in one part of the lesson they were causing lots of trouble.

Guideline 7

When in doubt about any segment of the transcript, then it should be classified as non-interactive.

Unitization

Where distinctions such as interactive and non-interactive are not involved, unitization is normally the first step in the coding process. However, because of the emphasis upon interactive data in this study it has become the second step in coding.

The unit of analysis is the "thought unit" or "ideational unit" as used by Bloom (1953), Taba, Levine and Elzey (1964) and Pichert and Anderson (1977). This unit can be defined as a remark or series of remarks, which expresses a more or less complete idea, and serves a

specified function. A simple word, a part of a sentence, a sentence or an entire paragraph can be designated as a thought unit. In this study, it was found that the thought unit often approximated a clause.

When coding interactive data each separate thought unit is to be enclosed in brackets.

Examples of Unitization of Teacher Thoughts

> T: (A way of reminding the kids that we did start it) (and we're just going to continue with that.) (Remind them that they were interested yesterday) (and we're going to finish.) (It was just introducing the whole thing of dinosaurs again,) (like this is what we are going to do now) (and we are continuing with something we started yesterday,) (just to get their minds rolling in the right direction.)

> T: (Mark. He's been absent) (so he didn't get his completed,) (but I'm angry at Steve) (because they have a week to do these maps) (and without fail there is always one or two there busily finishing up just at the beginning of the geography period.) (It's all a little bit of frustration) (and anger.)

The audio tapes were transcribed verbatim and no editing was carried out. Therefore, in many segments of the transcripts the teacher's dialogue does not flow as smoothly as in the above examples. Two common speech characteristics were "false starts" and "mazes" (Hunt, 1965). Because they do not express a more or less complete idea and serve a specified function, they are not to be unitized.

Examples of "False Starts"

Examples are underlined.

> T: I was hoping that they (we had spent quite a bit of time reviewing map skills) (and they had remembered where the continents were.)

> T: Well it's going to mean . . . I don't know (because well that would be the very beginning of the settlement I would put that in,) (probably show them, rather than have them do it.)

Examples of "Mazes"

Examples are underlined.

      T: Oh well, (yes, I didn't want them to do any more reading.) It was, I thought, by that, see I should have mentioned this. One of the reasons I did that, that way and I don't know if it's good or not, but anyway, (was that it was more tedious sort of type of reading) (and I thought that we could get through it a bit faster.)

      T: (He asked me to come over) and I think he may have spoken out, I can't remember if he, a lot of times they, "Mrs. X," (I think he just called my name.)

Category-Set

A category-set consists of a number of classes into which the units of qualitative data may be placed. In the case of this coding system the category-set is exhaustive because it provides for the classification of each and every unit of discrete data.

Twelve categories of interactive thoughts have been identified:

Instructional moves

Perceptions

Interpretations

Expectations

Meditation--pupil

Self-awareness

Beliefs

Objectives

Lesson content

Information--pupil

Information--other

Feelings

In the following pages each category is defined and illustrative

examples presented.

Instructional Moves (IM)

An instructional move is a category in which the teacher reports her thoughts about an action she was performing, had performed, or was considering performing. It is essential to remember that <u>action</u> is the key guide to instructional moves and that the teacher is the initiator of the action. Actions involve both verbal and non-verbal behavior and include the teacher explaining, questioning, directing, organizing and carrying out pupil control and management procedures. Teacher thoughts concerning actions to be carried out in the future are to be coded as instructional moves.

Examples (see parts in brackets):

T: (<u>I was just keeping track of what's going on in the classroom</u>) to make sure there isn't somebody, some I know will not even open their books when they're supposed to . . .

T: I remember that that particular page, (<u>yesterday I gave him a page on a specific skill,</u>) listening for the "a" sound.

T: (<u>And at the same time I'm mentally checking to see who's missing from the group</u>) and discovered that there was somebody missing.

T: No, no (<u>it was just a matter of getting something out</u>) (<u>and making it visible to people.</u>)

T: (<u>At that point there I thought boy I'd better remember to reinforce the idea of this barn thing.</u>)

T: (<u>I've heard them all so many times I had to pretend to be thinking about them.</u>)

T: (<u>so I just kind of tucked it away in my mind that I'd bring it up later again.</u>)

T: (<u>I was trying to get him interested in something like that</u>) and he just said "hmm" and walked away.

T: (<u>I was thinking that I should soon change the groups</u>

around.)

T: (I'm kind of ignoring what they say so I can talk.)

Perceptions (P)

A perception is a category in which the teacher reports a sensory experience. This involves seeing, hearing, noticing, smelling and feeling (in a physical sense). A perception represents awareness. However, awareness of self is not included in this category. Perceptions focus on what pupils or other people in the classroom say or do, materials, and other features of classroom life such as an awareness of time. Perceptions can also refer to past events and indicate the teacher's recall of a previous stimulus that had evoked a sensory influence.

Examples (see parts in brackets):

T: (The kids are yelling over at the record again.)

T: (One of the things on the wheel was colourful.)

T: (And he came back in for a while again.)

T: (At this point I've just noticed that Wayne was ready to participate.)

T: (And he did, he got them all right.)

T: (I realized that time was running short.)

T: (It has been hot for the past two days.)

Interpretations (I)

Interpretations are category units in which the teacher attaches meaning or explanation to a perception. A perception refers to something concrete, whereas an interpretation is an abstraction. Interpretations generally refer to pupil behavior, however, they can

also refer to inanimate objects such as time. It should be noted that an interpretation does not always refer to a perception that has been specifically mentioned in the transcripts. On occasions, the perception is inferred. A further point to be noted concerning perceptions is that they _often_ involve a judgement or evaluation on the part of the teacher.

Examples (see parts in brackets):

    T: (I knew it wasn't a good choice.)

    T: I'd feel disappointed, let down, (and I presume that's how they feel at this point.)

    T: I felt badly (because some of these kids are very keen right at this point.)

    T: (They're unaware that they're doing it.)

    T: (Sometimes they do know the words but don't know how to explain them or how to use them.)

    T: (Well they, you know, it just showed that they just don't care what they're doing in there.)

    T: Well just to tie them in (and, well I feel that sometimes some of them really don't grasp the concepts.)

Expectations (E)

Expectations are category units that refer to pupil behavior the teacher expects or anticipates will happen. They often refer to expected reactions to lesson content and organization, or overt instructional strategy employed by the teacher. Expectations can be expressed as positive, neutral or negative statements and refer to pupil affective behavior as well as cognitive behavior.

Care should be taken not to confuse expectations with information--pupil which refer to background knowledge about the pupils that the teacher brings to the classroom situation.

Expectations generally include verbs such as hope, expect, anticipate.

Examples (see parts in brackets):

T: (That's one I was sure they would say just like that.)

T: (because I know the kids are going to be finished reading.)

T: (At that point I remember saying to myself, "I'm going to have problems today.")

T: (Yes, because of the fact that we probably wouldn't see the lambs out there.)

T: (I knew they would laugh.)

T: (I was hoping it was as easily fixable as it was yesterday.)

T: (I thought that somebody for sure would remember Brontosaurus.)

Meditation--Pupil (MP)

This category unit does not occur very frequently in the transcripts. It refers to when a teacher is considering a pupil's or the group's mental processes. The teacher is concerned with how a pupil understands or remembers something or why a pupil does not understand or remember something. The teacher is essentially concerned with what "has gone on" in the pupil's head and is reflecting on the pupil's behavior.

Examples (see parts in brackets):

T: (Now how did she remember that?)

T: (I wonder how she is working that out?)

T: (I wonder if he is really understanding that.)

Self-awareness (SA)

This unit indicates that the teacher is thinking about her own behavior. She is conscious of her own performance in the classroom and

is aware of her behavior as she interacts with the pupils. Self-awareness indicates that the teacher is reflecting upon the instructional strategies she is using, or deliberating on future courses of action, or showing awareness of lack of content knowledge. It can also indicate the teacher is aware of her personality, appearance and general teaching style and is, on occasions, evaluating her teaching performance.

When the teacher discusses her physical feelings such as tiredness, then the thought is to be coded under "Feelings." However, emotions related to her teaching performance are coded as self-awareness.

Examples (see parts in brackets):

T: (and as I was standing there I thought, "I wonder if I look like I'm cranky?")

T: (The second before I asked what it was, I thought to myself, why did I put this one first, it is the least recognizable of all the five I chose.)

T: (I thought, that's my fault he didn't understand again.)

T: (And I didn't like the fact that I was doing it.)

T: (And I thought I should mention it and then I thought no.)

T: (And after I started I thought, maybe I shouldn't have started this.)

T: (I kind of thought to myself that was a good way of teaching that sound "sh.")

Beliefs (B)

Beliefs are statements by teachers about the characteristics and behavior of children. These statements allude to how children learn, remember, are motivated and why they behave in certain ways in the classroom. Often the statement has a developmental base and refers

to behavior the teacher considers appropriate for a particular age group.

Examples (see parts in brackets):

T: (The more concrete examples you can give the better they'll do.)

T: . . . you learn by doing. (If that's true for me it must be three times as true for 6 year olds.)

T: Oh to say that to remember the word. (Just to hear it is not enough.)

T: (They have a black and white attitude that it's either totally right or totally wrong.)

T: (Little quiet ones won't talk in a group unless you call on them.)

T: It sounds funny (but little guys like to talk)(and talking is really important to them.)

T: (You tell them but it doesn't mean as much as by the fact that they've had to solve the problem themselves.)

Objectives (O)

This is a category in which the teacher indicates pupil outcomes that are to be achieved. The objective statements are usually couched in terms which refer to what the pupils are expected to do or achieve in the lesson. Statements which indicate what the teacher plans to do are to be coded as instructional moves.

Usually an objective statement is accompanied by evidence to indicate what action is being taken to assist the pupils to achieve the goal.

Examples (see parts in brackets):

T: (Here I wanted them to really know that concept.)

T: (I wanted them to understand that this other colt was smaller too.)

T: (and I wanted them to use the powers of observation.)

T: (I wanted them to centre in on the most important parts of the stories, the highlights of the story just other than relating the full story to me.)

T: (And I wanted him to listen.)

T: (My point was that I wanted them to come to the conclusion that if he had a small head and small teeth he probably wasn't a meat eater.)

Lesson Content (LC)

This unit refers to the fact that the teacher is concentrating upon subject matter. Essentially the teacher is thinking about the content matter she is presenting to the pupils. Often the teacher is evaluating the subject matter she is presenting. However, when the teacher is considering how the subject matter should be presented, then, the thought is to be coded as an instructional move.

Lesson content thoughts can refer to subject matter from lessons previously taught, lessons to be taught in the future or the lesson presently being taught. At times the teacher will refer to content from past lessons.

Examples (see parts in brackets):

T: (Actually I was thinking of "The Frog and the Princess.")

T: (And I remembered that one time I had seen this potato planting machine you see, and there were people walking behind it and covering it all in.)

T: (At that point, I had just finished reading the book "Shogun", 1,200 pages.)

T: (And I thought that would be an excellent book for him to read because it's fairly low vocabulary, high interest.)

T: (There again I was tucking away in my mind that that particular pagoda has a long suspended pillar in it for the earthquakes.)

T: I did get David later on to look it up, (and like I mean it's not in formal English,) ("guy" wouldn't be used, it would be man or person.)

T: (He has to live in the water but he can't breathe like fish do.)

Information--Pupil (IP)

This is a category unit in which the teacher recalls and/or uses information about pupils in the lesson under focus. The information can be about individual pupils or the total class. Information often includes thoughts about the pupil's personality, academic potential, academic performance, home background and social behavior. Often this information is used by the teacher in decision making and in facilitating the flow of the lesson.

When coding, one is not concerned about the accuracy of the information.

Examples (see parts in brackets):

T: (Anita's a very poor speller) and I was just consciously trying to see if she could spell "adventure" for me without my help.

T: This was a particularly good group here, (these two students are low students.)

T: (Often she will do things incorrectly.)

T: Yes. But I didn't (because she is a weak student) and I didn't want to discourage her too much.

T: Oh yes, (he can do better than that.) I was very disappointed in his work.

T: (Well she has more difficulty in other subjects)(and she doesn't have the chance to shine as much as she does in Social Studies.)

T: Criticism can kill their enthusiasm (because they are low readers.)

Information--Other (IO)

This category unit contains collections of miscellaneous thoughts that occur frequently throughout the transcripts. Often they are classroom rules or thoughts irrelevant to the lesson.
Examples (see parts in brackets):

T: (They know they are not supposed to come up and interrrupt a conference unless it is an emergency like you're bleeding to death and that's about the only emergency.)

T: (They must always write their names on their papers.)

T: (I was wondering if I needed my raincoat for playground duty.)

T: (My husband likes sake wine, I don't know why.)

Feelings (F)

This is a category unit in which the teacher reports her emotions that were experienced during the lesson. Emotions are expressed about many classroom happenings and usually take the form of pleasure, surprise, annoyance, frustration and apprehension. When the teacher is expressing an emotion concerning her own teaching behavior, then, the thought is to be coded as "self-awareness."
Examples (see parts in brackets):

T: (And here I was surprised that she didn't know.)

T: (Well I was glad she did)(but I wasn't really surprised.)

T: (I was getting a lot panicky) but I was wondering if they knew anything about Japan at that stage.

T: (At that point I was getting annoyed) because Chris was acting silly.

T: (I was just a bit disappointed.)

T: (A tension), because I knew that some of them hadn't raised their hands at all.

T: (<u>I was very pleased.</u>)   (<u>I enjoyed it.</u>)

Coding Guides

1. Code each transcript segment by segment. A segment refers to the set of exchanges between interviewer and interviewee that centre around one particular stimulus point.

2. Decide according to the guidelines whether data is interactive or non-interactive.

3. Unitize interactive thoughts by including them in brackets.

4. Using the definitions provided, allocate each interactive thought to a category.

5. Often it is wise to unitize and allocate units to categories in the one move.

6. When quantifying the thought units, proceed through the transcripts segment by segment. If a thought unit is repeated on several occasions in any particular segment it is only to be recorded once.

APPENDIX G

LESSON VIGNETTES

Lesson Vignette - Number 1

Teacher: 1-1   Language Arts Lesson

Grade: First   Class Size: 19

Grouping: Heterogeneous

Lesson Topics: Vocabulary development, phonics, punctuation, oral reading, worksheet exercises, individual language arts exercises.

Lesson Objectives: 1. To extend pupils' vocabulary. 2. To introduce sounds SH and CH. 3. To revise punctuation concept--quotation marks. 4. To listen to individual pupils orally read. 5. To involve pupils in a variety of individual, integrated activities.

Instructional Modes: Demonstration; discussion; individualized instruction (self-directed activity).

Organization of Pupils: Whole class, small groups, individual tuition, individual programs.

Equipment and Materials: Reading books, worksheets, record player and listening post, typewriter, sewing card activity, chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Organized class, group and individual activities.	Listened to teacher, commenced silent reading.
Worked with individual pupil. Continued to monitor progress of rest of class.	Wrote sounds on chalkboard, other pupils completed silent reading, engaged in individualized tasks.
Asked first group to come up. Wrote vocabulary on chalkboard. Questioned pupils on knowledge of words.	Group sat in circle around teacher. Observed, responded to questions.
Placed another vocabulary exercise on chalkboard.	Went to chalkboard to complete exercise.
Gave out worksheet to pupils and explained the exercise.	Observed, listened to teacher, returned to seats.
Asked second group to come out. Wrote phonic exercise on chalkboard. Questioned pupils.	Group sat in circle around teacher. Observed, responded to questions.

Continued to monitor progress of the rest of the class.	Completed worksheet exercise or worked on individualized program.
Gave out worksheet to pupils and explained the exercise.	Observed, listened to teacher, returned to seats.
Asked third group to come out wrote punctuation exercise on chalkboard. Questioned pupils.	Group sat in circle around teacher, observed, responded to questions.
Gave out worksheet to pupils and explained the exercise.	Observed, listened to teacher, returned to seats.
Walked around room monitoring pupil progress.	Completed worksheet exercises or worked on individualized program.
Called individual pupils out for individual reading conferences. Questioned pupils on knowledge of stories. Listened to pupils read. Helped pupils to pronounce words.	Answered comprehension questions on story, read orally.
Continued to monitor progress of rest of class who are working on worksheet tasks or individualized tasks.	Completed worksheet exercise or worked on individualized program.
Assisted other pupils only between reading conferences.	Approached teacher for assistance between individual reading conferences.

Lesson Vignette - Number 2

Teacher: 1-1

Social Studies Lesson

Grade: First

Class Size: 19

Grouping: Heterogeneous

Lesson Topic: Dinosaurs

Lesson Objectives: 1. To review introduction session on dinosaurs. 2. To introduce general concepts about the five dinosaurs the pupils will be studying in detail.

Instructional Modes: Discussion; seatwork exercise--written.

Organization of Pupils: Seated on floor around teacher; seatwork.

Equipment and Materials: Encyclopaedia; pupil work booklets; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Asked pupil to show book to class. Responded to some pupil comments.	Showed book to class; peers called out and commented on pictures.
Introduced lesson topic of dinosaurs; questioned pupils; showed pictures of dinosaurs. Asked "how" and "why" questions.	Listened to teacher, answered questions, gave unsolicited comments observed pictures, commented. Responded to questions.
Read story about dinosaurs.	Listened to teacher, commented.
Questioned pupils.	Responded to teacher, commented.
Gave out dinosaur workbook, gave directions for use of book.	Studied booklet, listened to teacher.
Wrote words on chalkboard pupils needed to write in booklet.	Read out words teacher wrote on chalkboard.
Directed pupils to move to desks. Walked around room, monitored pupil progress.	Moved to desks, commenced tasks in booklet.
When requested, wrote words on chalkboard.	Requested teacher to spell words.

Lesson Vignette - Number 3

Teacher: 1-2

Grade: First

Language Arts Lesson

Class Size: 18

Grouping: Heterogeneous

Lesson Topic: Comprehension exercise; reviewing phonetic rule; vocabulary extension; oral reading; individual language arts exercises.

Lesson Objectives: 1. To evaluate students' understanding of a reading story. 2. To review the phonetic rule of "e" making the long vowel. 3. To practise using "when," "where," and "what." 4. To listen to individual pupils orally read. 5. To involve pupils in a variety of individual, integrated activities.

Instructional Modes: Demonstration; discussion; individualized instruction (self-directed activity).

Organization of Pupils: Small groups, individual tuition, individual programs.

Equipment and Materials: Reading books, worksheets, craft centre, record player and listening post, water centre, language centre, chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Worked with small group, discussed story in reading book.	Responded to teacher questions.
Monitored progress of rest of class.	Worked at individualized tasks.
Assisted pupil who broke a beaker at the water centre.	Broke beaker at water centre.
Gave out worksheet to pupils, explained the exercise.	Observed, listened to teacher, returned to seats.
Asked next reading group to come up.	Group sat in circle around teacher.
Wrote words on chalkboard, discussed words with pupils.	Observed, responded to questions.
Asked pupils to read words aloud and explain meanings.	Pupils read, explained meaning of words.
Gave out worksheet to pupils, explained the exercise.	Observed, listened to teacher, returned to seats.
Asked next reading group to come up.	Group sat in circle around teacher.
Wrote words on chalkboard, discussed words with pupils.	Observed, responded to questions.
Gave out worksheet to pupils, explained the exercise.	Observed, listened to teacher, returned to seats.
Assisted pupils who needed help with worksheets or individualized program.	Came to teacher, requested assistance.
Read to an individual pupil, asked pupil to continue reading. Helped pupil with reading	Followed in book, listened to teacher. Read to teacher, blended and sounded

difficulties. Encouraged pupil to work out answer himself.

words causing problems.

Monitored progress of the rest of the class; spoke to pupils engaged in disruptive behavior.

Class completing worksheet and individualized exercises. Speaking loudly, not working.

Assisted pupils who interrupted reading session.

Came to teacher for assistance.

Completed individual reading session; called up another pupil to read.

Returned to individualized activities.

Listened to pupil read; asked comprehension questions about content of story.

Read story, answered comprehension questions.

Asked pupil to show his craft creation.

Demonstrated how model worked.

Cuddled child as class went to recess.

Put arms around teacher to reciprocate cuddle.

Lesson Vignette - Number 4

Teacher: 1-2

Social Studies Lesson

Grade: First

Class Size: 18

Grouping: Heterogeneous

Lesson Topic: Dinosaurs--Brontosaurus.

Lesson Objectives: 1. To review information presented in introductory lesson on dinosaurs. 2. To present basic facts on the Brontosaurus.

Instructional Modes: Discussion; research; role playing.

Equipment and Materials: Books; pictures; model of Brontosaurus.

Summary of Lesson

Teacher Procedures and Skills

Pupil Behaviors

Asked questions on previous lesson about dinosaurs.

Responded to questions, offered comment about dinosaurs.

Showed pictures of dinosaurs.

Observed, listened, commented.

Asked questions related to pictures.	Responded to questions, offered comments.
Introduced new concept, fossils, discussion.	Responded to questions, commented, asked questions.
Introduced model of Brontosaurus.	Observed, listened.
Asked pupils to pronounce Brontosaurus.	Chorused responses.
Presented information about Brontosaurus.	Listened, commented.
Asked pupils "how" and "why" questions about the Brontosaurus.	Responded to questions, commented.
Gave pupils books on dinosaurs, asked pupils to find pictures of Brontosaurus. Assisted some pupils to find picture.	Looked through books, some pupils asked for assistance.
Showed and discussed pictures with class.	Observed, listened, commented.
Summarized what pupils had found out about Brontosaurus.	Responded to questions.
Asked pupils to role play a Brontosaurus walking.	Walked like a Brontosaurus.

Lesson Vignette - Number 5

Teacher: 1-3   Language Arts Lesson

Grade: First   Class Size: 17

Grouping: Homogeneous (All of the youngest entrants to first grade were placed in this class.)

Lesson Topic: Reading, language, individual tasks.

Lesson Objectives: 1. To teach vocabulary. 2. To practise phonetic skills. 3. To listen to pupils orally read. 4. To complete comprehension exercises. 5. To involve pupils in a variety of individual, integrated activities.

Instructional Modes: Demonstration; discussion; individualized instruction (self-directed activity).

Organization of Pupils: Small groups, individual tuition, individual programs.

Equipment and Materials: Reading books; worksheets; record player and listening post; chalkboard; individual work centres.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Organized morning's session.	Moved to groups and centres.
Worked with reading group, asked comprehension questions on previous story read.	Responded to teacher questions.
Listened to two members of group read, assisted pupils who needed equipment or who needed help with worksheets.	Read orally. Asked teacher for assistance.
Monitored progress of rest of class.	Worked at centres or on worksheets.
Discussed vocabulary with group members, placed difficult vocabulary words on chalkboard.	Observed, sounded and read words.
Monitored progress of rest of class, ordered several pupils to work.	Worked at centres or on worksheets. Some pupils not engaged in work.
Directed pupils to change centres.	Moved to new tasks.
Asked new reading group to come out.	Sat in circle around teacher.
Asked group comprehension stories about previous story read.	Responded to teacher questions.
Discussed new story with group.	Listened, responded to questions.
Asked pupil to read.	Read story, peers followed.
Discussed difficult vocabulary words with pupils.	Listened, responded to questions.
Asked pupils in turn to read, wrote difficult vocabulary words on chalkboard, discussed	Read orally, sounded out vocabulary words, responded to questions.

words.

Assisted pupils who came up from centres for help.	Asked teacher for help to complete worksheets or individual tasks.
Asked comprehension questions.	
Read to group.	
Gave phonic drill using chalkboard.	Sounded out words on chalkboard.
Sent group to complete comprehension task.	Moved back to desks.
Moved around the room supervising pupils at work at centres.	Completed worksheets or individualized tasks.

Lesson Vignette - Number 6

Teacher: 1-3   Social Studies Lesson

Grade: First   Class Size: 17

Grouping: Homogeneous (All of the youngest entrants to first grade were placed in this class).

Lesson Topic: The Farm.

Lesson Objectives: 1. To discuss purposes of animals. 2. To discuss what animals' babies are called. 3. To draw and describe favourite animals. 4. To prepare for a farm visit.

Instructional Modes: Discussion; seatwork exercise--written.

Organization of Pupils: Seated on floor around teacher; seatwork.

Equipment and Materials: Large picture of farm scene; pictures of individual animals; workpaper.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Showed pictures of adult and baby farm animals to class.	Observed, commented, responded to questions, asked questions.
Discussed names of baby animals.	Responded to questions, commented.

Asked pupils to repeat names of baby animals.	Repeated in unison several times the names of the baby animals.
Placed pictures on display board.	Observed teacher, commented.
Discussed how to handle baby animals.	Responded to questions, commented.
Showed picture of cow and milking machine.	Responded to questions, asked questions, commented.
Discussed milking by hand and by machine.	Responded to questions, commented.
Showed picture of tractor. Discussed farm machinery.	Responded to questions, asked questions, commented.
Discussed animals on a farm the class will soon visit.	Responded to questions.
Discussed how pupils should behave on visit.	Responded to questions, commented.
Sent pupils to seats and asked them to draw their favourite animal on a piece of paper and write a story about the animal.	Returned to seats. Drew favourite farm animal, wrote story.
Moved around room supervising and helping pupils.	Asked for assistance in spelling difficult words.

Lesson Vignette - Number 7

Teacher: 3-1   Language Arts Lesson

Grade: Third   Class Size: 24

Grouping: Homogeneous (The "top" third grade class in the school, graded on reading ability).

Lesson Topic: Creative writing.

Lesson Objectives: 1. To utilize the elements of story writing, to implement setting, characterization, description, plot, climax and imaginative content.

Instructional Modes: Discussion; seatwork exercise--written.

Organization of Pupils: Seated on floor around teacher; working at desks.

Equipment and Materials: Five dial-a-story cards; chalkboard; composition books.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Selected pupil to record class responses on chalkboard.	Moved to chalkboard.
Discussed creative writing based on 5 W's--"Who," "Where," "When," "Why," and "What" (mood).	Responded to questions.
Asked pupils to dial a "W" card to get framework for story.	Dialed wheels to select elements of the story.
Discussed each "W" as it was dialed.	Responded to questions, commented, suggested.
Guided pupils into developing the story.	Suggested.
Asked pupils to vote on any alternatives presented.	Chose direction of story.
Gave pupils turns to build the story.	Responded with ideas.
Asked pupils to close eyes and think about the story.	Eyes closed, "thinking."
Sent pupils back to seats to write own stories.	Moved to own seats.
Discussed vocabulary pupils could use in stories.	Suggested words.
Outlined story on chalkboard and used a summary model.	Observed, responded to questions.
Directed pupils to start writing stories.	Wrote stories.
Moved around room supervising and assisting pupils.	Wrote stories, asked for assistance with vocabulary.

Lesson Vignette - Number 8

Teacher: 3-1

Social Studies Lesson

Grade: Third   Class Size: 24

Grouping: Homogeneous (The "top" third grade class in the school, graded on reading ability).

Lesson Topic: Introduction to new unit on Japan.

Lesson Objectives: 1. To motivate students to become interested in the topic of Japan. 2. To create awareness of Japan's geographic location.

Instructional Modes: Quiz; discussion; demonstration; seatwork-- written.

Organization of Pupils: Seated at desks; seated on floor around teacher.

Equipment and Materials: Workbooks; wall map; globe; wall display on Japan; Japanese artifacts such as kimono, wooden sandals, chopsticks, doll, etc.; books and pictures about Japan; map of Japan for pupils to complete.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Gave pupils pretest on Japan.	Wrote answers on paper.
Corrected and discussed answers.	Marked answers, responded to questions.
Used wall map to illustrate position of Japan in the world.	Observed, responded to questions.
Directed pupils' attention to Japanese display at back of room.	Observed, responded to questions.
Asked pupils to sit in circle at front of room.	Moved to front of classroom.
Showed class Japanese artifacts, asked questions.	Observed, answered questions, asked questions, commented.
Described own visit to Japan.	Listened, asked questions.
Used map and globe when discussing climate of Japan.	Observed, responded to questions.
Discussed Japanese buildings.	Listened, responded to questions.
Discussed Japanese industry.	Responded to questions.

Discussed Japanese food and clothing.	Observed artifacts, responded to questions, commented.
Sent pupils back to desks, gave out maps of Japan.	Returned to seats, studied map of Japan.
Gave instructions how to complete map.	Listened to teacher.
Moved around room supervising map work.	Worked on map.
Presented content about Japan while supervising.	Listened to teacher, worked on maps.

Lesson Vignette - Number 9

Teacher: 3-2   Language Arts Lesson

Grade: Third   Class Size: 29

Grouping: Homogeneous (The "second" of three third grade classes in the school, graded on reading ability).

Lesson Topic: Creative thinking-vocabulary extension.

Lesson Objectives: 1. To develop feelings and identify with an inanimate object. 2. To encourage divergent thinking.

Instructional Modes: Discussion; role playing.

Organization of Pupils: Seated at desks; lined up at teacher's desk.

Equipment and Materials: Stencilled worksheet; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Asked pupils to concentrate on being something else.	Responded with answers such as dinosaur, porcupine.
Asked pupils why they chose the particular thing.	Responded to questions.
Continued to probe.	Responded to questions.
Asked class to pretend to be a balloon.	

Asked pupils how they felt being a balloon.	Replied with a variety of feelings, gave reasons for feelings.
Asked pupils to feel terrified, pretended to stick pin in balloon.	Imagined were a balloon, reacted to pin.
Asked pupils how they felt when the pin was going in and was being pulled out.	Responded with a variety of feelings, gave reasons for feelings.
Asked pupils to pretend to be an ice cream.	Pretended to be an ice cream.
Asked pupils how they felt when being licked, when melting.	Responded with a variety of feelings.
Gave out stencil with five tasks about feelings to complete.	Read stencil.
Explained exercise to pupils.	Listened to teacher, asked questions.
Moved around room supervised and assisted pupils with vocabulary.	Worked on exercise. Asked teacher for assistance.
Asked for papers to be handed in when finished.	Handed in completed exercise.

Lesson Vignette - Number 10

Teacher: 3-2   Social Studies Lesson

Grade: Third   Class Size: 29

Grouping: Homogeneous (The "second" of three third grade classes in the school, graded on reading ability).

Lesson Topic: Japan.

Lesson Objectives: 1. To develop concepts of modern, traditional and western. 2. To develop pupils' knowledge of modern Japan.

Instructional Modes: Discussion; demonstration.

Organization of Pupils: Seated at desks.

Equipment and Materials: Projector, stripfilm, "Tokyo: World's Largest City"; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Questioned pupils about Tokyo.	Responded to questions.
Showed stripfilm of scenes of Tokyo.	Observed, commented.
Questioned pupils on scenes and discussed concepts of traditional and modern.	Responded to questions, asked questions, commented.
Continued to show stripfilm scenes.	Responded to questions, asked questions, commented.
Discussed Japanese industry, imports and exports. Emphasis on Japan as an industrialized nation.	Responded to questions, asked questions, commented.
Discussed government of Japan compared to Canada.	Responded to questions, asked questions, commented.
Discussed problems of over-crowding in cities.	
Returned to discussion of traditional and modern.	Responded to questions.

Lesson Vignette - Number 11

Teacher: 3-3

Language Arts Lesson

Grade: Third

Class Size: 18

Grouping: Homogeneous (The "third" of three third grade classes in the school, graded on reading ability).

Lesson Topic: Reading.

Lesson Objectives: 1. To introduce new reading book. 2. To select a story to read. 3. To expand vocabulary.

Instructional Modes: Pupil investigation; recitation; discussion.

Organization of Pupils: Seated at desks.

Equipment and Materials: Reading book, "With Skies and Wings."

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Explained reading book will be used for the next two weeks.	Listened to teacher.
Asked pupils to browse through book.	Looked at different stories in the book.
Described the organization of the book.	Listened to teacher, responded to questions.
Asked pupils what story they would like to read first.	Replied with story preferences.
Directed class to vote to choose a story.	Voted to select first story to read.
Read chosen story to class.	Followed in own books.
Discussed vocabulary and content of story.	Responded to questions.
Read two other stories.	Followed in own books.
Paused frequently for pupils to read any difficult words.	Chorused out answers for missing words.
Discussed content and vocabulary of stories.	Responded to questions, commented.
Discussed pictures in stories.	Responded to questions, commented.

Lesson Vignette - Number 12

Teacher: 3-3

Social Studies Lesson

Grade: Third

Class Size: 18

Grouping: Homogeneous (The "third" of three third grade classes in the school, graded on reading ability).

Lesson Topic: Natural history--geology of Alberta.

Lesson Objectives: 1. To develop an understanding of the ancient animals that inhabited Alberta. 2. To develop an understanding of past geological features of the Alberta landscape.

Instructional Modes: Showing pictures from book; discussion.

Organization of Pupils: Seated on floor and tables around teacher.

Equipment and Materials: Book, "The Western Plains."

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Reviewed previous lesson on the topic.	Listened, responded to questions.
Showed class pictures from a book.	Observed, commented, asked questions.
Pointed out and explained features of the pictures.	Observed, commented, asked questions.
Asked questions about the pictures.	Responded to questions, asked questions.
Related landscape scenes to present Alberta.	Responded to questions, looked outside classroom at landscape.
Discussed Drumheller, dinosaurs and fossils.	Responded to questions, asked questions, commented.

Lesson Vignette - Number 13

Teacher: 6-1   Language Arts Lesson

Grade: Sixth   Class Size: 35

Grouping: Heterogeneous

Lesson Topic: Language usage; oral reading; creative writing.

Lesson Objectives: 1. To review language usage. 2. To read orally with expression. 3. To write a paragraph giving reasons for wanting to be prime minister.

Instructional Modes: Correction; discussion; recitation; seatwork-- written.

Organization of Pupils: Seated at desks.

Equipment and Materials: Workbooks; textbooks, "How Many Miles;"

composition books.

Summary of Lesson

Teacher Procedures and Skills

Corrected homework exercise.

Checked class's performance
on homework.

Asked pupils to use dictionary
to find meaning of word.
Discussed use of the word.

Asked pupils to take out
textbooks.

Directed pupils to take turns
to orally read a paragraph
from the text.

Assisted pupils if unable to
pronounce words.

Wrote title for paragraph
length composition on
chalkboard.

Asked pupils if they needed
assistance.

Moved around room supervising
and assisting pupils.

Assisted pupils with spelling.

Distributed language exercise
to pupils.

Pupil Behaviors

Responded with answers.

Indicated number of questions
correct.

Found word in dictionary, read
meaning to class.
Listened to teacher's explanation.

Opened textbooks.

Took turns at oral reading.

Observed, asked questions.

Asked questions.

Wrote compositions.

Asked teacher for assistance.

Lesson Vignette - Number 14

Teacher: 6-1

Grade: Sixth

Grouping: Heterogeneous

Lesson Topic: The geography of Italy.

Social Studies Lesson

Class Size: 35

Lesson Objectives: 1. To become aware of the geography of Italy.
2. To copy down notes about Italy.

Instructional Modes: Presentation of notes; seatwork--written; discussion.

Organization of Pupils: Seated at desks.

Equipment and Materials: Social Studies books; pupil maps; overhead projector and maps; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Outlined how lesson will proceed.	Listened to teacher.
Wrote notes on chalkboard.	Copied notes from chalkboard.
Handed out maps.	Copied notes from chalkboard.
Asked pupils to set up screen and overhead projector.	
	Asked content questions about topic.
Explained how map is to be completed.	Observed, listened.
Wrote instructions for map on chalkboard.	Observed.
Moved around room, supervised and assisted.	Completed map.
Discussed rules for colouring in mountains and oceans.	Listened to teacher.
Continued to move from desk to desk supervising and assisting.	Completed map.
Concluded lesson by again demonstrating how map should be coloured in.	Observed, listened.

Lesson Vignette - Number 15

Teacher: 6-2

Grade: Sixth

Language Arts Lesson

Class Size: 23

Grouping: Heterogeneous

Lesson Topic: Phonics (Syllabification)

Lesson Objectives: 1. Review skills of splitting words into syllables.
2. Practice syllabification skills.

Instructional Modes: Game; discussion; seatwork--practice.

Organization of Pupils: Small groups around room; seated at desks.

Equipment and Materials: Syllable cards dealing with road signs;
worksheets; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Explained syllable game to pupils.	Listened to teacher.
Divided class into groups of four.	Moved into work groups.
Gave each group a different exercise, five minutes given to complete the exercises.	Crowded over desks, placed word puzzle together.
Walked around room, supervised groups at work.	Worked at game.
Every five minutes pupils changed and moved onto a new activity.	Worked with each new puzzle in turn.
Corrected syllable games.	A group member wrote an answer on the chalkboard.
Discussed answers on chalkboard. Asked class to correct those that were incorrect.	Responded to teacher questions.
Checked on each group's performances on game.	Responded with results of group performance on the task.
Asked class to take out phonic books.	Took out phonic books.
Discussed use of prefix and suffix. Gave examples, questioned pupils.	Listened to teacher. Responded to questions.

Directed pupils to complete exercises in phonics book.	Commenced work on phonic exercises.
Moved around room supervising, worked at own desk.	Worked on phonic exercises.
Observed pupils (from desk) at work. Assisted pupils requesting help.	Worked on exercises, asked for assistance when needed.
Left desk. Reviewed rules for splitting words into syllables.	Listened to teacher.
Moved around room, assisted pupils.	Completed phonic exercise.

Lesson Vignette - Number 16

Teacher: 6-2   Social Studies Lesson

Grade: Sixth   Class Size: 23

Grouping: Heterogeneous

Lesson Topic: Geography (Mapping)

Lesson Objectives: 1. To discuss strengths and weaknesses of previous completed map. 2. To assess general knowledge of previous mapping exercises. 3. To introduce pupils to map of Asia.

Instructional Modes: Discussion; quiz; seatwork--written.

Organization of Pupils: Seated at desks; class divided into two groups.

Equipment and Materials: Wall map; stencilled maps; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Checked on mapping exercise and discussed problem areas raised by pupils.	Checked over their work. Asked teacher to clarify any difficulties. Answered teacher questions.
Handed back previous mapping exercise. Gave general overview of class's performance. Gave positive and negative comments to pupils as individual	Waited to receive map back, listened to teacher, read teacher comments on own map.

maps were handed back.

Displayed "best" map to class, discussed it.	Observed map, listened to teacher.
Explained to class the geography quiz they were going to have.	Listened to teacher.
Divided class into two even groups. Gave rules for the quiz.	Listened to teacher.
Asked pupils questions about cities, countries and continents.	Responded in turn to questions.
Went down rows, asked questions in a fixed order.	Responded to questions.
Motivated pupils by telling them questions were "easy" or "hard."	
Reinforced correct answers.	Responded to questions.
Reprimanded pupils for criticizing their peers.	Some pupils being rude and criticized peers who made mistakes.
Concluded quiz, gave results to groups.	Winning group cheered.
Reinforced purpose of quiz and what it had revealed.	Listened to teacher.
Collected homework.	Handed in maps.
Gave out new map of Asia.	Studied map of Asia.
Used wall map to describe and explain features of Asia.	Observed, listened to teacher.
Gave instructions on how to complete the map.	Listened to teacher.
Assisted some pupils with problems.	Commenced work on map.
Sat down at desk, assisted pupils who came up for help, monitored class's behavior.	Requested assistance when needed.

Lesson Vignette - Number 17

Teacher: 6-3   Language Arts Lesson

Grade: Sixth   Class Size: 27

Grouping: Homogeneous

Lesson Topic: Punctuation (comma).

Lesson Objectives: 1. To make pupils aware of the different uses of commas. 2. To practice placing commas in sentences.

Instructional Modes: Discussion; lecture; practice--application.

Organization of Pupils: Working at seats organized in rows.

Equipment and Materials: Pupil worksheets; chalkboard.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Monitored pupil readiness.	Took out workbooks.
Introduced lesson objectives and format.	Listened to teacher.
Directed two pupils to read worksheet examples.	Pupils read, class listened.
Directed class to complete exercises.	Completed exercises in workbooks.
Corrected exercises using chalkboard.	Volunteers and non-volunteers read out answers.
Placed example exercises on chalkboard, discussed examples.	Listened, asked questions, answered questions.
Explained and discussed use of comma with various types of sentence structures.	Listened, observed examples on chalkboard.
Directed class to complete punctuation exercises.	Completed exercises in workbooks.
Supervised pupils. Assisted pupils who needed help.	Completed exercises in workbooks.
Corrected pupils' exercises. Used chalkboard for demonstration purposes.	Volunteers and non-volunteers read out answers.
Discussed and explained use of	Listened to teacher.

comma. Examples placed on chalkboard, relevant sections underlined.	Observed chalkboard.
Directed pupil to read punctuation rule.	Punctuation rule read from worksheet.
Questioned volunteers and non-volunteers concerning use of rule.	Responded to questions, some unable to answer.
Examples placed on chalkboard.	Observed, listened.
Discussed examples.	Observed, questioned.
Discussed meaning of "sentence" and "clause."	Listened, responded to teacher questions.
Gave pupils practice exercises.	Worked on exercises.
Corrected exercises.	Read out answers.
Worksheet exercises given.	Completed exercises.
Direction for uncompleted work to become homework.	

Lesson Vignette - Number 18

Teacher: 6-3   Language Arts Lesson

Grade: Sixth   Class Size: 27

Grouping: Homogeneous

Lesson Topic: Drama (Play--"Tom Sawyer")

Lesson Objectives: 1. To improve pupils' speaking. 2. To develop an understanding of the personalities of the characters in the play. 3. To practice the play.

Instructional Modes: Role playing; discussion; demonstration.

Organization of Pupils: Class organized into two groups. Groups took turns to rehearse in front of teacher in school hall.

Equipment and Materials: Play scripts.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Introduced lesson, related to previous drama lesson. Outlined objectives and format for present lesson. Questioned pupils on understanding of lesson's objectives.	Listened to teacher. Responded to teacher questions.
Sent one group to another room to practise play.	Group left room.
Observed group acting.	Rehearsed play.
Interrupted occasionally to give directions, compliment pupils on performance or assist pupils with voice production or movements.	Most pupils read parts from the script.
Sent out group to another room, brought other group back.	Groups exchanged places.
Discussed need to know parts "by heart."	Listened to teacher.
Discussed mood of play.	Listened to teacher, responded to questions.
Observed group acting.	Rehearsed play.
Interrupted occasionally to give directions.	
Sent for other group to act as audience.	Group returned.
Summarized day's performance, outlined future drama work that would be done.	Listened to teacher, responded to questions, made suggestions.

Lesson Vignette - Number 19

Teacher: 6-3

Grade: Sixth

Grouping: Heterogeneous

Lesson Topic: Ancient Rome and Carthage.

Social Studies Lesson

Class Size: 27

Lesson Objectives: 1. To test pupils' knowledge of Ancient Rome and Carthage. 2. To evaluate two students' oral reports. 3. To develop understanding of the concept "Pyrrhic victory."

Instructional Modes: Quiz; reporting; discussion.

Organization of Pupils: Seated at desks.

Equipment and Materials: Workbooks; two student reports; social studies notes; wall display on Ancient Rome.

Summary of Lesson

Teacher Procedures and Skills	Pupil Behaviors
Gave quiz on previous work.	Wrote down answers.
Moved around class supervising.	
Directed pupils to exchange papers.	Exchanged papers with neighbour.
Gave pupils correct answers.	Corrected papers.
Moved around classroom monitoring answers.	
Responded to pupil queries on alternate correct answers.	Checked on possible alternate correct answers.
Reprimanded pupils whose queries were irrelevant.	Checked on possible alternate correct answers.
Asked pupil to give report on Carthage.	Pupil read out report, class listened, then asked questions.
Sat at desk evaluating report.	
Asked pupil to give report on Hannibal.	Pupil read out report, class listened then asked questions.
Collected reports.	
Directed pupils to take out social studies folders.	Took out folders.
Asked pupils to take turns to read out social studies notes.	Read in turn a paragraph of notes.
Discussed concepts and facts raised in the notes.	Listened, responded to questions, asked questions.

Discussed Rome, Carthage and "Pyrrhic victory". Questioned pupils.	Listened, responded to questions.
Discussed concept of European Common Market.	Responded to questions.
Discussed if U.S.A. and Russian relationships could be a parallel to Rome-Carthage relationships.	Responded to questions, gave solutions.
Related discussion to concept, "Pyrrhic victory."	

APPENDIX H

TEACHER INFORMATION SHEET

TEACHER PRESAGE INFORMATION

1. NAME:_____

2. AGE: Check one (✓). Under 25_____ 25 - 30 _____

   30 - 35_____ Over 35 _____

3. Number of years of teacher education for salary purposes _____

4. What degrees/diplomas do you presently hold? Check (✓) appropriate spaces.

   a. _____ None

   b. _____ Graduate Diploma

   c. _____ Higher Diploma

   d. _____ B.Ed.

   e. _____ B.A. (Specify major) _____

   f. _____ B.Sc. (Specify major) _____

   g. _____ Other (Specify degree and major) _____

   _____

5. Where did you receive your teacher education? _____

   _____

6. Could you list all courses taken in educational psychology, year taken and grade received?

Course	Year Taken	Grade
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. Years of teaching experience _____

8. Years of teaching in your present school _____

9. Grade level(s) taught this school year _____

10. Years of teaching experience on present grade(s) _____

11. What grade level(s) are you most interested in teaching?_____
    Could you briefly give supporting reasons?

    _____

    _____

    _____

    _____

12. What subjects do you teach your class(es)? _____

    _____

    _____

13. Are there any subject areas in which you specialize in the school?

    _____

14. Number of pupils in class(es)_____

15. Administrative grouping plan (e.g. parallel class). Briefly
    describe.

    _____